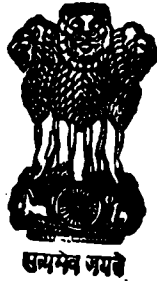


GOVERNMENT OF INDIA  
MINISTRY OF TRANSPORT



REPORT  
ON THE  
SURVEY OF MINOR PORTS IN INDIA

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# REPORT

## PART I



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## PART I

### REPORT

#### 1. INTRODUCTORY

At the first meeting of the National Harbour Board held on the 28th August, 1950, the Board recommended that an officer should be appointed to collect information relating to Minor Ports and to make recommendations regarding improvements. In pursuance of the above, the Government of India, Ministry of Transport, appointed Shri S. Nanjundiah, Port Administrative Officer, Vizagapatam Port, as Officer on Special Duty for carrying out a survey of the Minor Ports.

The terms of reference were briefly as follows :—

- (i) Collection of information relating to the traffic handled by Minor Ports, number and size of ships visiting the ports, existing and potential facilities for handling goods, staff and financial conditions and existing administrative machinery, and
- (ii) To make proposals regarding administrative machinery and other improvements necessary to ensure fuller use of these ports.

#### 2. INSPECTION AND SURVEY OF PORTS

I took over the duties of Special Officer on the 18th January 1951, and after a preliminary study and discussions at New Delhi, visited the Headquarters of the maritime States and the important Minor Ports. Besides officials connected with the ports, railways, customs, shipping and light-houses, a number of non-official bodies were contacted. A list of places visited and non-official or semi-official bodies contacted is given in Appendix I. The ports selected for visit were fairly representative and exhaustive in the case of all states except Bombay. More of the Bombay ports could not be visited for want of time and lack of convenient transport facilities. This omission has not, however, been a serious one and does not affect the main conclusions reached.

#### 3. SCOPE OF SURVEY

This is the first comprehensive survey of the minor ports of the Union of India as a whole after Independence and after the political and financial integration of the former Indian States. The previous all-India Survey of Ports by the Ports Technical Committee in 1946 covered many vital points of interest to Major and Minor Ports but the then existing political set-up of India did not permit of unified action or the evolution of uniform policy.

The minor ports in India present an amazing variety in size and functions, volume of traffic handled, financial position and administrative set-up. The facilities provided vary from nothing in some of the open Roadstead ports on the sea board to five elaborate harbours with dredgers and equipment as some in Saurashtra ; from Ports handling only a few hundred tons per year to as much as 5,00,000 tons per year ; from Ports

with an income of only a few hundred rupees per year to ones with an income range of Rs. 6 to 8 lakhs per year ; from Ports very well and efficiently administered as in Madras State to those which "also run".

#### 4. CLASSIFICATION OF PORTS

The above points to the need for a further classification of the minor ports. At present, all ports which are directly under the Central Government are called Major Ports and all other ports which are under the direct administrative control of State Governments go under the classification of Minor Ports. This is an arbitrary though politically and administratively convenient method of classification. The term "Minor Ports" is taken unpleasantly if not with a degree of resentment by those concerned with some of the bigger and important minor ports. A strict definition of a major port is not easy. The Ports (Technical) Committee have clarified the distinction between a Major and Minor Port. As a rule, all Major Ports are capable of taking in ocean-going steamers with a registered tonnage of 4,000 or more and berth them alongside wharves. This should be regarded as an essential feature of a major port. Only two minor ports—Okha and Bhavanagar—have wharves or piers capable of berthing deep draft steamers. In all other ports, steamers stand out at anchorages and cargo between them and shore is handled by boats, lighters or barges. At others, the traffic is carried by sailing vessels from or to other coastal ports or foreign countries.

#### 5. INTERMEDIATE PORTS

Apart from major ports, a further sub-classification of the Ports now coming under the category of Minor Ports appears necessary. Here, a broad classification on the basis of tonnage handled and/or facilities available could be made. A classification of minor ports is attempted below. Ports which handle or have handled in the past one lakh of tons or more of cargo per year or are otherwise important are classed as Intermediate Ports. Other ports with an annual cargo tonnage below one lakh but not less than 1,500 tons or which have an importance for any other reason (such as passenger amenity, customs or naval requirements etc.) may be classed as minor ports. All the remaining ports may be classed as sub-ports or petty ports. The proposed classification is shown below :—

| State        | Total<br>No. of<br>ports<br>declared<br>open | Intermediate Ports |   | Sub-<br>Ports | Remarks |
|--------------|--|--------------------|---|---------------|---------|
|              |  | Name of Port       | Minor Ports                               |               |         |
| 1            | 2  | 3                  | 4   | 5             | 6       |
| West Bengal. | ...  | ...                | ...                                       | ...           | ...     |
| Orissa       | 9  | ...                | (1) Chandbali<br>(2) Puri<br>(3) Gopalpur | ...           | ...     |

| 1   | 2  | 3  | 4  | 5                      | 6   |
|---|----|--|--|------------------------|---|
| Madras  | 55 | 1. Kakinada<br>2. Masulipatam<br>3. Cuddalore<br>4. Nagapattinam<br>5. Kozhikode<br>(Calicut).<br>6. Mangalore<br>7. Tuticorin | 1. Calingapatam<br>2. Bhimlipatam<br>3. Porto Novo<br>4. Pamban<br>5. Dhanushkodi<br>6. Ponnani<br>7. Badagara<br>8. Tellicherry<br>9. Cannanore<br>10. Kasargod<br>11. Malpe<br>12. Hungarkatta<br>13. Coondapur  | All<br>other<br>Ports. |   |
| Travancore-<br>Cochin.                        | 9  | 1. Alleppey  | 1. Quilon.   |                        |   |
| Saurashtra                                    | 60 | 1. Bhavanagar<br>2. Verawal<br>3. Porbunder<br>4. Bedi<br>5. Navalakhi   | 1. Mahuwa<br>2. Talaja<br>3. Victor<br>4. Jaffarabad<br>5. Sika<br>6. Salaya<br>7. Jodiya<br>8. Nawatunder<br>9. Mangrol   | All<br>other<br>Ports. | The Port of Ja-<br>ffarabad may<br>eventually be<br>transferred to<br>the class<br>of Inter-<br>mediate ports.          |
| Kutch   | 7  | 1. Mandvi  | 1. Mundra.   |                        | The Port of<br>Jakhau may<br>be added to<br>the list of<br>minor ports<br>when the<br>Salt Works<br>are com-<br>pleted. |
| Bombay<br>(including<br>old Baroda<br>Ports). | 87 | 1. Okha<br>2. Broach<br>3. Ratnagiri<br>4. Karwar.   | 1. Gogha<br>2. Dhollera<br>3. Kavi<br>4. Surat<br>5. Bulsar<br>6. Bulimora<br>7. Navsari<br>8. Dahanu<br>9. Umergaon<br>10. Bassein<br>11. Vessawa<br>12. Ravanda<br>13. Bankot<br>14. Dhabhol<br>15. Devghad<br>16. Jaighod<br>17. Mora<br>18. Achra<br>19. Vengurla<br>20. Tadri<br>21. Ankola<br>22. Honavar<br>23. Vijaydurg<br>24. Bhatkal<br>25. Jaitapur<br>26. Malvan<br>27. Dwarka<br>28. Kodinar | All<br>other<br>Ports. |   |

| 1  | 2 | 3 | 4   | 5 | 6 |
|--|---|---|---|---|---|
| Bombay (including old Baroda Ports).<br>(contd). |   |   | 29. Cambay<br>30. Nangaon<br>31. Rajpuri<br>32. Harnai<br>33. Dehej<br>34. Kalyan<br>35. Panvel<br>36. Karanja<br>37. Murud<br>38. Sadashivghad<br>39. Kumta<br>40. Belikeri. |   |   |

State Governments may like to make some changes in the list and indeed developments may take place which may necessitate such changes in the classification. Even if formal recognition is not given to such a re-classification of ports the list helps to view them in the proper perspective and to focus attention on the more important ones. In fact, it would be more helpful to the transport economy of the country as a whole to have a few well equipped Intermediate Ports suitably placed geographically and well maintained. The 15 to 18 Intermediate Ports in the list would provide the country with a very good system of second line of ports. Considering the size of the coast line of India, 6 or 7 Major Ports and 15 to 18 important minor ports are not too many.

## 6 NEW MAJOR PORTS

With two possible exceptions, one on the coast of Orissa and the other at South Kanara, there is no case or justification for opening of additional Major Ports in India. The former is being examined and investigated by the C. W. P. C. and the latter question has been referred to the Poona Hydraulic Research Station. The development of some of the leading Minor Ports into Major Ports may be considered later if as a result of industrial development, the country is able to export and expand its overseas trade and finances permit of such development. Okha, Tuticorin and Bhavanagar may be considered first for such development. We may now regard a cargo tonnage of 5,00,000 per annum as the minimum requisite trade for a major port at the outset, rising to 8 or 10 lakhs of tons in 10 years. Very few places suggested for locating and constructing Major Ports show promise of traffic of the above magnitude. Would-be promoters of Major Ports often stress the Engineering and Marine possibilities of a place and almost assume that once facilities are provided, trade will follow automatically. Their underlining the Naval and strategic importance of almost any place is amusing. There are no doubt a number of creeks and river mouths where Harbours could be constructed but what for is the question. In my opinion, no place should even be considered ripe for an Engineering and Marine Survey for the purpose of establishing a major port unless a rapid traffic survey offers possibility of at least 3,00,000 tons of new traffic (not diverted from other ports).

## 7. IMPROVEMENT OF MINOR PORTS

On the other hand there is a great scope for the improvement and utilization of many of the Intermediate and Minor Ports at comparatively small additional capital outlay. A hydrographic survey of these ports and their approaches, a planned scheme of dredging, provision of modern

cargo handling appliances such as jetties, cranes, and tugs or launches, amenities for passengers etc., will go a very long way to satisfy immediate needs. The problems of some of the important ports is dealt with under individual ports.

## 8. MEDIUM SIZED PORTS

Some of the present minor ports are capable, at not very great capital outlay, of construction of medium sized ports capable of taking coastal ships drawing 15 to 18 ft. (about 3,000 tons). Chandbali, Kakinada, Tuticorin, and Bey pore are some of the places which lend themselves easily to such development. The justification for such works depends, however, upon the economics and policy with regard to the construction of the future coastal steamers. If ships of small draft and tonnage as are now in use on the upper West Coast are introduced and used on the East and lower West Coasts also—and there is no reason why they should not be—there would be a great stimulus to the coastal trade. What effect this will have on the traffic of the adjacent ports and the coastal railways has to be studied in each individual case after a decision with regard to the size of coastal ship has been taken. If the decision is to continue to use the large sized ships of 4,000 tons or more drawing over 20 ft. for the coastal traffic, there would be no necessity or advantage in dredging or maintaining the depths at berths or approaches at more than—8.00 *i.e.*, 8 ft. below low water. The gap between this *i.e.*,—8.00 and—25.00, the minimum depth required at a major port is quite a big one and medium sized vessels, naval or mercantile, have no place in the majority of the existing minor ports—a state of affairs which cannot be considered as satisfactory. An early decision on the question whether ships of small size should be introduced for the coastal trade, should be taken as the whole future course of minor ports development policy depends on it.

## 9. KEEPING OPEN OF DEFUNCT PORTS AND OPENING OF NEW PORTS

The number of ports notified as open for traffic is 226 but the number of working ports, *i.e.*, ports through which some traffic however small has passed through in the last few years is only 150 as per the distribution shown below :—

| State                       | No. of ports declared open under the Indian Ports Act | No. of working ports |
|-----------------------------|---|----------------------|
| Orissa . . . . .            | 9   | 3                    |
| Madras . . . . .            | 54  | 30                   |
| Travancore-Cochin . . . . . | 9   | 6                    |
| Bombay . . . . .            | 87  | 80 (approximate)     |
| Saurashtra . . . . .        | 60  | 29                   |
| Kutch . . . . .             | 7   | 7                    |
|                             | 226   | 150 (approximate)    |



It is thus seen that a large number of petty ports are ports in name only. It is for the consideration of State Governments whether some of these cannot be closed down and economies effected either in Port or in Customs establishment or both. In spite of the situation being as above, it is often noticed that new ports are declared open with little or no financial or trade justification and often as a result of local enthusiasm. Whenever it is proposed to declare open a new port, it is suggested that the prior concurrence of the Ministry of Transport should be obtained. This step is necessary to give co-ordinated consideration to such proposals.

#### 10. SURVEY OF PORTS

Another important item, information regarding which is necessary before any scheme of expansion and development of a Port is undertaken, is a hydrographic survey of the approaches to the Port and in some cases the anchorages. Many of the gulfs, creeks and river mouths have also to be surveyed systematically not only for the use of the river or creek ports wherever such exist but also for river conservancy and conservation of the coastline and in some cases with a view to examine the possibility of opening up the Inland waters for navigation purposes. The necessity for the survey is not open to question although priorities have to be fixed to draw up a programme. The surveys should, it is suggested, be carried out by the Union Government through the agency of the Hydrographic Survey Wing of the Indian Navy or other agency. As regards costs, it is suggested that the costs of the initial survey and of any steps necessary for the conservation of the coast should be the concern either of the Union Government or of the State Government concerned or both in agreed proportions and not of the Ports either individually or collectively. It should however be the responsibility of each Port to carry out, at its own cost, the periodical marine surveys of the quiet waters of the inner harbour.

#### 11. AGENCY FOR CARRYING OUT THE SURVEYS

To carry out the hydrographic surveys as stated above, within a reasonable time, the present Wing under the Indian Navy will have to be trebled. Two units, it is considered, will be permanently required, one for the Bay of Bengal and one for the Arabian Sea. The third unit would be required for two or three years only to attend to initial non-recurring work. Alternatively, the formation of the third unit may be avoided by entrusting a portion of the work to a reputed firm of Hydrographic Surveyors who may be expected to furnish its own equipment for carrying out the survey.

As regards priorities, the following tentative list is put up in the order of urgency :—

- The Gulf of Kutch
- The Gulf of Cambay
- Okha
- Mangalore
- Malpe
- Beyport
- The Khori Creek north of Kutch
- Tuticorin
- Kakinada
- Narsapur
- Pamban, and so on.

## 12. DREDGING

The dredging of Ports and approaches is more or less a common problem in many ports which are not pure open beach ports. Many of the northern ports on the West Coast have been able to carry on because of the high range of tides. Such dependance on tides however reduces the working hours and also throws a great strain on the limited floating equipment available in order to get through the transhipment of cargo between ship and shore. Dredging varies from a simple operation of removing a few thousand tons of sand per year in comparatively calm waters to complicated and large-scale dredging as at Bhavanagar. The problem of dredging at the minor ports can be classified roughly into 3 types.

- (i) Simple dredging of silt and sand or droppings in the inner harbours and alongside wharves and in comparatively calm approach channels. The siltation is an accumulation of a decade or so during which time no dredging was done and is only slightly and slowly recurring and could be removed by a suitable dredger employed for a few months. Once this silt is removed, the Port can carry on for a long time before its usefulness for lighter or barge traffic is again impaired.

- (ii) The dredging of sand bars at the sea entrance to the ports, examples of this are the east coast ports—Masulipatam, Cuddalore, Nagapattinam and Mangalore and Mandvi. The siltation or sand accretion in these cases is recurring, and their removal can be attempted only in certain seasons of the year. In most cases the monsoon floods scour out a channel which keeps deep enough for several months but at a time of the year when there is usually no shipping. Unfortunately, siltation as well as low tides occur during the period most favourable for working of steamers at anchorages. No quantitative estimates of the annual siltation at these Port entrances have been made nor is it known how soon the bars will be reformed once they are removed. The calm season is usually November to May though November as well as May, may also turn out to be rough weather in particular years and at particular places. Only 4 or 5 months are usually available for dredging in bars. This circumstance, *viz.*, that bar dredging at all required places has to be carried out simultaneously in the 4 or 5 calm months makes it necessary to have a larger number of dredgers and dredging equipment than would otherwise be necessary.

The effect of the construction of reservoirs and other river valley schemes on ports has not yet been studied but it appears on the whole to be other than beneficial. While it is true that there will be a reduction in the volume of silt brought by the rivers, the scouring action of freshets is also lost and sand bars formed remain uncleared. The Mangalore experiment proposed to

be made at the Poona Hydraulic Research Station may throw some light on this question also.

- (iii) Dredging in alluvial soil and very fine silt which hardly settles down and where the range of tide is very great as at Bhavanagar presents another type of problem. Here it looks as though each successive tide brings in and deposits a layer of silt and the dredged basin or channel constantly shrinks. The target of to-be-dredged and to-be-maintained depths at minor ports may be fixed at—8.00 (Bhavanagar and Okha excepted).

### 13. DREDGERS

A list of dredgers available is given in Appendix No. 13. Many of these are old and are on their last legs. The number and type of dredgers available are totally insufficient even for the immediate needs, not to speak of development dredging. Replacement of old, worn out and obsolete dredgers has also to be considered urgently.

### 14. POOLING OF DREDGERS

The creation of a pool of dredgers which the needy ports can draw upon has often been suggested in various quarters. The idea is sound but it has various limitations. In the first place, the number of dredgers now available and their condition hardly provides even a nucleus for such a pool. Secondly, many of the dredgers though still have some more years of useful life are not sea-worthy for long voyages except in the fairest weather when they ought to be working, not moving from place to place. Thirdly, the type of dredger available in one place is not necessarily suited for another place. Fourthly, the season suitable for dredging is short and the same dredgers are needed at several places simultaneously. Fifthly, administrations owning dredgers have usually been most reluctant to take the risk of lending their only craft and when they do agree to lend out, the tendency is to be excessively guarded and impose terms which are so very exacting as to discourage such borrowing of dredgers except in emergencies. It would no doubt be possible to surmount this difficulty by mutual give and take but the first essential is to have adequate sized pools, the very existence of which will remove the causes for great reluctance in lending dredging plant. For the size of India's coastline and the number of major and minor ports concerned two pools might be formed :—

- (i) One for Madras Ports including the Tuticorin Port Trust. As the needs of Orissa and Travancore-Cochin are very little, they may also depend on this pool in the first instance. The dredgers in this Pool may be owned, maintained and run by the Madras Minor Ports Fund and costs apportioned to the places of work.
- (ii) One for the Saurashtra and Bombay Ports including the Port of Okha which is now administratively under the Bombay State. Bombay minor ports are hardly likely to be able to bear the costs of dredging and such demand is likely to be very little. The dredgers should therefore be owned, maintained and worked by the Saurashtra Port Authority and costs adjusted where necessary.

Only the Port of Mandvi in the Kutch State needs any dredging and it is suggested that Mandvi should get its requirements from Kandla or Saurashtra whichever is feasible at the required time. Infact, the dredger "Rukmavati" built for Mandvi but now with Kandla Port ought to be able to take care of dredging at Mandvi. A Grab Dredger with two mud barges would be able to deal with all the inside dredging at Mandvi. The Madras Pool of dredgers should acquire the following additional items of dredging plant in addition to the existing ones which should also be renovated and maintained in good working condition :—

- (i) One grab dredger with mud flats and/or hopper barges for the circars Ports.
- (ii) One grab dredger with mud flats or Hopper barges for Tuticorin.
- (iii) One grab dredger with mud flats or Hopper barges for Mangalore.
- Total—3 Grab dredgers and 6 Hopper barges of 100-ton capacity each.
- (iv) One bucket dredger of the "Tuticorin" type and size.
- (v) One bucket-cum-suction dredger of the "Coromandel" type in place of the "Gouthami" disposed of recently. The purchase of this may be deferred to a later date.

The estimated cost of the above dredgers for the Madras Pool is about Rs. 70 lakhs.

The Saurashtra Pool of dredgers should, apart from the special type of dredger that may be recommended for Bhavanagar, consist of the following additional units :—

- (i) One grab dredger with 2 hopper barges of 100-ton capacity each for Navalakhi and Bedi ports ;
- (ii) One grab dredger with 2 hopper barges of 100-ton capacity each for Porbunder and Verawal Ports.
- (iii) Two new steel pontoons for the dipper dredgers at Porbunder and Verawal.

The estimated cost of these is about Rs. 15 lakhs.

Items (i) and (ii) above could also be made available for Okha and Mandvi when required. It is not considered feasible at present to include the major ports in the Pool though such a step will follow eventually. The present position with regard to dredgers in the major ports is not satisfactory—with the possible exception of Cochin—and the types of dredgers available are not likely to be usable at the Minor Ports even if they could be spared on account of deeper drafts required by the dredgers at Major Ports.

It is difficult to make out a full financial justification for the outlay on dredgers but they are essential for the upkeep of the ports. The ports would nowever be able to pay their operating expenses. The expenditure may be spread over the next three years.

## 15. MAINTENANCE OF STATISTICS

Due to various reasons, statistics have not been maintained properly and systematically in the past. Many ports have recorded figures of value of trade and not tonnage. In some cases (Saurashtra and Travancore) the period was not from April to March but August to July or July to June.

In one case, the figures were in the old native State currency. It is only from 1-4-1949 that the Indian official year and Indian Union currency are adopted uniformly by all States for collection of statistics. Traffic figures are also being maintained in tonnage in recent years. Proper comparison with pre-war years is not therefore easy. Collection and maintenance of statistics by the States for each port on a uniform basis is very necessary and desirable. Monthly and annual figures of the following should be maintained :—

- (i) Imports and Exports in tons by different commodities ;
- (ii) Number and tonnage of foreign-going, coastal and sailing craft separately ;
- (iii) Receipts and expenditure under each Fund separately.

The financial year April to March and the standard ton of 20 cwts. should be followed for all statistics.

The Ministry of Transport may lay down a list of returns to be sent by the States in respect of some or all of the minor ports in each State. The list of returns would no doubt also include budgets, annual accounts and administration reports relating to ports. A book or pamphlet containing all relevant information concerning the port should be compiled for each Intermediate Port somewhat on the model of Madras Ports information books.

## 16. TRADE

Detailed figures of trade and passengers passing through the minor ports is given in the statement appended. An abstract of the trade in 1949-50 is given below for ready reference.

|  | Imports   | Exports   | Total     | Remarks                                 |
|--|-----------|-----------|-----------|---|
| (1)                                    | (2)       | (3)       | (4)       | (5)                                     |
| 1. Orissa Ports . . . .                | 5,100     | 17,900    | 23,000    | Approximate figure computed from value. |
| 2. Six important ports of Madras       | 2,39,843  | 4,67,798  | 7,07,641  |   |
| 3. Remaining ports of Madras .         | 81,217    | 1,25,553  | 2,06,770  |   |
| 4. Tuticorin . . . . .                 | 2,58,717  | 1,67,386  | 4,26,103  |   |
| 5. Travancore-Cochin . . .             | 20,000    | 2,82,000  | 3,02,000  | Estimated figures,                      |
| 6. Bombay ports except Okha .          | 4,00,000  | 6,00,000  | 10,00,000 | Approximate computed figures.           |
| 7. Okha . . . . .                      | 2,37,164  | 2,22,643  | 4,59,807  |   |
| 8. Five important ports of Saurashtra. | 4,63,550  | 4,26,373  | 8,90,023  |   |
| 9. Remaining ports of Saurashtra       | 34,285    | 84,369    | 1,18,654  | Computed.                               |
| 10. Kutch Ports . . . . .              | 32,097    | 4,812     | 36,909    |   |
| TOTAL .                                | 17,72,073 | 23,98,834 | 41,70,907 |   |

It is seen from the above table that 77·5 per cent. of the total trade of Madras passes through its six important ports excluding Tuticorin. Similarly, 88·3 per cent. of the total trade of Saurashtra passes through its five important ports. Taking India as a whole, the 18 ports classed as Intermediate Ports, deal with about 65 per cent. of the total. Out of the total trade shown in column (4) above, nearly 40 per cent. is carried by country craft, Bombay minor ports being highest. Madras, Travancore-Cochin and Saurashtra have a certain amount of foreign trade. The rest is mostly coastal.

The total aggregate traffic capacity of the ports is between 3 to 4 times the above though not at each place. This capacity can be maintained and even improved upon by small local improvements and dredging wherever necessary.

#### 17. PASSENGER TRAFFIC

There is little or no passenger traffic on the east coast except for the regular sailings to the Malay States and Singapore from Nagapattinam, and the Indo-Ceylon traffic through Dhanushkodi and Tuticorin. Coastal passenger traffic is almost confined to the West Coast between Mangalore as the Southern limit and Mandvi (Kutch) as the Northern limit

The Indo-Ceylon traffic is showing signs of decline but the inter-coastal traffic continues undiminished notwithstanding the very meagre facilities available for the landing and shipping of passengers at the Bombay ports. A statement of passenger traffic in 1949-50 and 1950-51 through Bombay Ports is given in Appendix No. 12.

#### 18. TRENDS OF TRAFFIC

Although it is difficult to forecast the trade that may be expected to pass through the minor ports in future years, there is every prospect of the minor ports continuing to handle a traffic of about four million tons per year. The demand for building materials, firewood and timber is likely to increase and in any case not diminish. The transport of salt from the west-coast ports to Bengal and Assam will also be more or less permanent. The movement of raw materials and foodgrains will continue in the southern Bombay, Saurashtra and Kutch ports as these are the only suitable distributing centres in the absence of good railways and roads. The extent to which ports will be made use of as distributing centres for coal depends upon the rail-cum-shipping policy. Cuddalore, Tuticorin, Bhavanagar, Okha and Navalakhi offer scope for utilisation as regular coal distributing ports, especially railway coal. Small bunkering stations may also be established at Tuticorin, Bhavanagar and Okha for the convenience of steamers. Many cement works are situated in Saurashtra and there is scope for more. It is likely that cement will continue to move by sea to the big consuming centres like Bombay city and Kandla.

While the prospects, of maintaining and increasing coastal trade are bright, there is a tendency for foreign trade to fall off at the minor ports due mainly to the policy regarding Exports of Groundnuts and other raw materials.

The whole economy of the States of Kutch and Saurashtra has developed on their ports. The former is even now isolated from the rest of India by the seas and the Ranns. Even after the completion of the Kandla-Deesa railway line, large parts of the State of Kutch will continue to depend on Kutch Minor Ports for supplies and for export of salt from at

least 3 big salt factories now almost ready to be started. The mainland of Kutch is traversed by 3 mountain ranges running from East to West. This will always be an impediment to the development of internal railways. Ports therefore offer the only cheap and efficient means of communication between different parts of the State. Ports on either side of the Gulf of Kutch carry on an appreciable amount of foreign trade by country craft visiting ports in Pakistan, Persian Gulf and East Africa.

#### 19. COUNTRY CRAFT (SAILING)

As stated under the para. dealing with trade, approximately 40 per cent. of the trade of Minor Ports is carried by sailing vessels. A large number of minor ports depend on the efficient working and operation of the sailing craft, for their trade. Every facility should be given for their upkeep, maintenance and repairs and laying up during non-working seasons, at as many ports as possible. In particular, the ports of Kakinada, Cuddalore, Tuticorin, Beypore, Mangalore, Karwar, Bhavanagar, Verawal, Bedi, Navalakhi, Okha and Mandvi may take action to provide such facilities. In Tuticorin and Mandvi (Kutch), boat-building has been going on for decades. The industry is however languishing and must be revived and encouraged. It is in the interests of the Minor Ports themselves to foster this industry.

In this connection, recommendation Nos. 71 to 75 of the Sailing Vessels Committee (May 1949) may be seen.

#### 20. TUGS, LAUNCHES, LIGHTERS, BARGES ETC., FOR HANDLING OF TRAFFIC AT PORTS

A list of floating equipment available at Ports is found in Appendix No. 14. Kutch, Orissa and Bombay excluding Okha have no fleet for handling cargo. These ports depend entirely on private enterprise to provide the necessary craft. Madras and Travancore provide tugs at some of the important ports but no lighters or barges. Four departmental lighters were provided at Alleppey but it is stated that the Port authority is not in favour of continuing or extending the system of Port ownership of lighters. Only at Okha and the five important ports of Saurashtra are tugs, launches, steel barges and wooden lighters provided by the Port authority. The needs of individual ports with regard to tonnage of lighters needed is dealt with under individual cases. (Report Part II.)

The provision of lighters and barges may be left to private agency wherever possible as at Madras but the policy with regard to tugs should be that Port authorities should provide the same and hire them out for towage purposes. They alone can provide the necessary workshops and slipways or dry docks for repairs and run them in a manner which is collectively most advantageous. Exceptions may be made and private bodies allowed to use their own tugs in particular ports and for particular trades, *e.g.*, Salt, Cement, etc., but in general, ownership and control of tugs should remain with ports.

The purchase of additional tugs is suggested for the following places :

|                           |           |
|---------------------------|-----------|
| 1 for Cuddalore . . . . . | 150 H. P. |
| 1 for Tuticorin . . . . . | 250 H. P. |
| 1 for Mangalore . . . . . | 250 H. P. |
| 1 for Porbunder . . . . . | 159 H. P. |

One or two of the existing old tugs of low H. P. at Porbunder may be released for use elsewhere. Bhavanagar Port would do well to get rid of 2 or 3 of the small power tugs and go in for one Twin Screw tug of about 750 H. P. If any Port needed a powerful tug, it is Bhavanagar. Bombay ports on the Konkan coast may be provided with 2 or 3 tugs of about 150 H. P.

Summarising, the total requirements of additional tugs will be :—

|                                     | Estimated cost.  |
|-------------------------------------|------------------|
|                                     | Rs.              |
| 1 tug of 750 H. P. . . . .          | 7,50,000         |
| 2 tugs of 250 H. P. . . . .         | 6,00,000         |
| 5 tugs of 150 H. P. . . . .         | 10,00,000        |
| Total 8 tugs at a cost of . . . . . | <u>23,50,000</u> |

Launches may be added to the fleet at Intermediate Ports as funds permit. A launch measuring 36' × 9' × 3' with a 40 H. P. Diesel Engine costs about Rs. 40,000 and may be standardised for future purchases.

With the addition of the above tugs and launches it would be possible to form 3 or 4 pools of tugs and launches but it is unlikely that interchange will be as necessary or as frequent as in the case of dredgers.

## 21. RAILWAYS

Six important ports of Madras and five in Saurashtra and the Port of Okha are served by railways. The yards are well laid out and are adequate for known trade requirements. The shortage of wagons and trucks is however great especially on the meter gauge section. It is hoped that this shortage will reduce if not disappear as soon as more wagons become available. In the course of the Inspection of ports, representations were made with regard to the following new railway lines connecting the ports :—

- (a) *Tuticorin*.—The construction of a railway line connecting Manmadura with Tuticorin thereby linking the districts of Tinnevely, Ramnad and Madura. This request deserves to be fully examined.
- (b) *Mangalore*.—A railway line connecting Mangalore with the hinterland of Mysore. Although this is a part of the scheme of the West Coast Major Port project, the necessary investigations for the Railway scheme may be gone on with independently of the Port project.
- (c) *Jaffarabad (Saurashtra)*.—The existing railway line to Rajula may be extended to Jaffarabad. The distance is about 12 miles.
- (d) *Gopalpur—Ecrampore—Russalkonda—58 miles*.—The construction of the above line at a cost of about Rs. 1½ crores would improve the prospects of Gopalpur port.

There are practically no railways within the State of Kutch. Any railway construction policy in that State should take its Ports into account.

The proposed link between Cochin and Quillon in Travancore State might affect the minor ports and the Inland water transport in that State.



## 22. MISCELLANEOUS

(a) *Communications*.—Telephones and Telegraph communications facilities at most of the Minor Ports are poor. Such facilities and wherever possible wireless should be extended to all ports other than petty or sub-ports. In this matter, priority should be given to ports with a fair amount of passenger traffic. The Bombay Steam Navigation Company who handle most of the passenger traffic have made a special request about the improvement of communications at the ports at which they call.

(b) *Roads*.—The hinterland of the ports on the Konkan coast (*i.e.*, South Kanara, North Kanara, Ratnagiri and Colaba districts) are not well served by roads. As coastal railway lines are impossible in this area, the construction of good all-weather roads should receive high priority. Roads to ports and between ports in Kutch and Saurashtra are also poor but they appear to be taken note of in the respective States' Road Programmes. Roads leading to Mangalore and Malpe suffer from disabilities due to numerous unbridged rivers. All-weather roads to these ports would be a great advantage.

(c) *Provision of facilities for Customs Examination of passengers and their luggage*.—At several places it was brought to my notice that it took several hours for the passengers to go through the examination of their luggage. Provision of lines of benches to lay out baggage and proper lighting of sheds would help to complete the Customs Examination speedily. Efficient customs barriers, fencings, or compound walls are also necessary from Customs as well as security points of view.

(d) *Registering and licensing of boats, country craft and mechanically propelled vessels and their periodical inspection, provision of Life Saving appliances, etc.*—The present arrangements for carrying out the above duties is not very satisfactory except in Orissa and Madras States. Suitable Harbour Craft Rules should be drawn up and competent technical persons should be authorised to register or issue licenses or alternatively the licensing authority should obtain technical assistance.

(e) *Working hours, holidays and overtime*.—Questions of public holidays, Charter Party holidays and close holidays, overtime payments to Customs and Port officials, working hours etc., do not seem to have settled down to routine in the Part 'B' States where Central Sea Customs were recently introduced, *i.e.*, Saurashtra and Travancore-Cochin. The State Governments and Collectors of Customs concerned may frame rules to cover these points and make these rules known to the public.

## 23. RATES AND CHARGES

The dues and charges levied at ports need to be revised on a rational basis. Their origin is lost in the early decades of this century. All that is done now seems to be to re-adjust rates to suit budgetary necessities. Wholesale revision of rates is not however easy and should wait till conditions stabilise.

The charges made at ports vary very widely. It is not possible nor is it necessary to bring about a rigid uniformity in rates throughout India as say in the case of Railways or Posts & Telegraphs but the present wide variation which in the past was due to competition and to differences in administrative conditions in the country may be narrowed down. Maintenance of uneconomic rates of charges to attract trade from neighbouring ports should no longer be allowed.

I have examined in detail one of the items, *viz.*, Port dues on ships and country craft. A summary of the prevailing rates is given below :—

*Orissa*.—As. 4 per ton on sea-going vessels of 10 tons and upwards, at each entry except that coasting vessels pay only once in 30 days.

*Madras (excluding Tuticorin)*.—The Madras Ports are grouped into 2 groups, Eastern and Western. A very elaborate schedule prescribing the dues at first Port of call in each group ; at the second Port in that group ; at the third and subsequent ports in that group is notified. Outside one group of ports, similar payments are due at the ports of the other group. Different rates are notified for coastal steamers and for sailing vessels. Mangalore has its own rate notified.

*Tuticorin*.—Foreign-going vessels—As. 3 per ton payable on each entry into Port.

Coasting vessels—As. 2 per ton payable only once in 30 days.

Sailing vessels—Anna one per ton payable only once in 60 days. 7

*Travancore-Cochin*.—Steamers—9 pies per ton payable only once in 30 days for any port in State.

Sailing vessels—9 pies per ton payable only once in 60 days for any port in State.

*Bombay*.—Sailing vessels over 10-tons—As. 6 per ton payable once in 30 days only in any port.

All ports form only one group. Mechanically propelled vessels of more than 10 tons—As. 9 per ton payable once in 30 days only in any port.

*Okha*.—Foreign-going steamers—Rs. 10-1-6 per ton payable once in one month.

Sailing ships per trip—Rs. 3.

Coasting steamers up to 50 net registered tonnage per trip—Rs. 5.

Coasting steamers over 50 net registered tonnage per trip—Rs. 15.

*Kutch*.—Sea-going vessels of 10 tons and upwards—As. 2 per ton payable once in 30 days at the same port.

Coasting vessels of 10 tons and upwards—Rs. 0-1-6 per ton once in 30 days at any port in Kutch.

Country craft—Anna one per ton payable once in 30 days at any port in Kutch.

Tugs, ferries, etc.—As. 2 per ton once in half calendar year.

*Saurashtra*.—Steamers—As. 2 per ton payable once in any port in each group.

Sailing ships—As. 2 per ton payable once in 30 days in any port in each group.

Tugs, ferries, launches, etc. — As. 2 per ton per half calendar year.

The great differences in rates and conditions between ports in adjacent States is striking—9 pies per ton in Travancore to 9 annas per ton in Bombay. The question requires investigation and a certain amount of levelling up or down effected.

A suggestion has been made that in order to simplify collection of landing and shipping charges, the rates of charges should be so framed as to represent a certain percentage of the value of the articles, *i.e.*, charges to be *ad valorem*. This suggestion is not recommended. Values are very fluctuating and give rise to various difficulties. Port services have a relation to weight and bulk of cargo handled. These are constant for a given commodity.

Landing and shipping fees on goods and passengers also need revision in the light of present day working costs. Several States have already taken action.

## 24. ACCOUNTS AND BUDGETS

(a) *Port Accounts*.—Details of the accounting and budget systems of the Port Funds or Port Departments were not gone into. The following general observations are however made.

The Part 'A' States of Orissa, Madras and Bombay have had separate Port Funds and/or Pilotage Funds and Landing & Shipping Fees Funds constituted long ago. Okha and Tuticorin have their own funds.

In Part 'B' States, *i.e.*, Travancore-Cochin and Saurashtra, Port finances are merged in the State budgets and accounts and the Ports are run through a Marine Department in Travancore and the Communications department in Saurashtra. Kutch has started a Port Fund account. The accounts heads as now maintained in Saurashtra are very confusing. Receipts and expenditure on Pilotage, Wharfage, Port dues, Capital works, replacements etc. are all mixed up. In view of the size and importance of Saurashtra ports, early steps should be taken, in consultation with an Accounts Officer with Port accounts experience to systematise the accounts and decide upon the main and detailed heads of accounts under the different funds to be opened. The Government of Madras could perhaps lend an accounts officer for a short period.

(b) *Capital Accounts*.—Excepting in respect of the five important ports of Saurashtra and the ports of Okha and Tuticorin, no information is available at any of the other ports on the Capital Outlay up-to-date or the value of assets. The expenditure on harbours and port facilities in all other States appear to have been met out of Government grants or revenue earnings. The capital assets may therefore be regarded as created by revenue. Many assets including land the value of which has increased considerably in course of time, exist without any value assigned. It would be useful to have an assessment made and proforma accounts maintained. At a very rough calculation, the total value of capital assets of all the minor ports would be about Rs 15 crores.

As future financing of port development works may have to be from loans with or without interest, the maintenance of Capital Accounts separate from Revenue accounts is very necessary. A certain financial limit—say Rs 5,000 or Rs. 10,000 according to size of port may be laid down for new works or equipment to be charged to Capital.

(c) *Depreciation Reserve Funds*.—Excepting in the solitary case of the Tuticorin Port, no depreciation fund has been formed at any other port or group of ports. As Tuticorin the fund covers only the dredger. The

present state of the finances of many of the ports do not permit of any contribution to a depreciation Reserve Fund. A full scale depreciation Fund covering all assets is not very necessary but there should be a "Plant and Craft Replacement Fund" to which revenues of ports should contribute whenever they are in a position to do so and where contributions are not possible, a proforma account may be maintained. Such funds may be maintained either for individual ports or for the groups.

(d) *Pilotage Accounts*.—The Indian Ports Act requires that Pilotage Fund receipts and expenditure should be accounted for separately. Necessary action may be taken at all ports where Pilotage is optional or compulsory. Where pilots for country craft and small vessels are locally available but not in the employ of the Port, they should be licensed after examination by a competent technical officer and the maximum rates chargeable prescribed.

## 25. FINANCES

(i) The financial position of minor ports is by no means sound. The receipts and expenditure in the year 1949-50 were as follows :—

|   | Receipts  | Expenditure           |
|---|-----------|-----------------------|
|   | Rs.       | Rs.                   |
| 1. Orissa . . . . .                           | 27,478    | 50,514                |
| 2. Madras Minor Ports Fund . . . . .          | 4,39,205  | 10,32,899             |
| 3. Madras Landing and Shipping Fund . . . . . | 7,22,563  | 7,40,413              |
| 4. Tuticorin :—                               |           |                       |
| Port Fund . . . . .                           | 1,14,091  | 62,919                |
| Port Trust Fund . . . . .                     | 4,84,406  | 7,57,719              |
| 5. Travancore Cochin . . . . .                | 26,148    | 28,457                |
| 6. Bombay :—                                  |           |                       |
| Minor Ports Fund . . . . .                    | 1,81,616  | 2,21,883              |
| Landing and Wharfage Fees Fund . . . . .      | 1,34,114  | 91,270                |
| 7. Okha . . . . .                             | 8,36,486  | 8,81,932              |
| 8. Saurashtra . . . . .                       | 32,04,771 | 36,82,300             |
| 9. Kutch . . . . .                            | 19,305    | Figure not available. |

The figures of expenditure do not include any figure for contribution to a Depreciation Fund.

Except at Tuticorin, the trend is for expenditure to exceed receipts.

(ii) *Balances in Statutory Funds.*—At the end of 1949-50 the balances in Port Funds were as follows :—

|  | Cash     | Securities | Total     |
|--|----------|------------|-----------|
|  | Rs.      | Rs.        | Rs.       |
| 1. Orissa (Gopalpur) . . . . .                     | 19,351   | 1,49,300   | 1,68,651  |
| 2. Madras Minor Ports Fund . . . . .               | 5,47,696 | 32,15,000  | 37,62,696 |
| 3. Madras Landing and Shipping Fund . . . . .      | 1,76,755 | 9,04,300   | 10,81,055 |
| 4. Madras Pilotage Fund . . . . .                  | 1,443    | 2,67,600   | 2,69,043  |
| 5. Tuticorin Port Fund . . . . .                   | 97,308   | 1,90,600   | 2,93,508  |
| 6. Tuticorin Port Trust Fund . . . . .             | 64,034   | 8,62,800   | 9,26,834  |
| 7. Tuticorin Depreciation Fund . . . . .           | 15,479   | 4,83,700   | 4,99,179  |
| 8. Bombay Minor Ports Fund . . . . .               | 35,173   | 2,30,100   | 2,65,273  |
| 9. Bombay Landing and Wharfage Fees Fund . . . . . | 77,616   | 5,10,900   | 5,88,516  |

As regards the other States, Travancore and Kutch Ports have been a drain on the State's finances. Kutch has just started a Port Fund. Saurashtra ports' finances are merged with the State finances. There is however a reserve of about Rs. 175 lakhs at Bhavnagar built up by the late State Rulers.

The States of Orissa, Madras and Bombay are drawing upon their reserves annually and at the present rate, there will be no balances in 3 or 4 years' time unless trade improves.

The Madras Pilotage Funds are solvent and have a comfortable reserve.

The reserves in the various Port Funds are only to be regarded as Revenue and Reserves and for minor works and no surplus is available for undertaking capital development works.

Where an individual port has its own funds and is not grouped with other ports, it is not very necessary to have a separate Port Fund and a landing and Shipping Fees Fund. It will greatly facilitate smooth working to have one General Account for all receipts and expenditure except those relating to Pilotage Fund. The Tuticorin Port Fund and the Tuticorin Port Trust Fund may therefore be combined into one general account as at Major Ports, if necessary, under different abstracts. Necessary legislation to permit of this may be introduced by Madras State.

(iii) *Improvement of the finances of the Minor Ports.*—Apart from any improvement in the Receipts of Ports which may result by an increase in trade, there is not much scope for increasing the revenues of Orissa and Kutch. The salt works at the latter will bring prosperity to the Ports and with certain improvements at Ports, trade also will be stimulated.

The rates at Madras are already as high as the traffic can bear and any improvement in finances can only be as a result of increased trade. Bombay, Okha and Saurashtra ports can improve their finances by putting up their

rates and charges for landing and shipping. Bombay ports, for instance, with its million tons of traffic and over a million passengers using the ports, get only a negligible amount as wharfage dues. Okha has recently increased its rates but further rises are necessary to balance its budgets. At Saurashtra, there is a Port Development levy at  $\frac{3}{4}$  per cent on all goods passing through the Ports from and to the Indian Union. This was started as a temporary measure to make the transition from pre-integration conditions to post-integration conditions as gradual and smooth as possible.

The raising of a separate levy should be discontinued by raising the landing and shipping charges suitably and the change should be brought about simultaneously with the introduction of the Saurashtra Port Funds which has been recommended elsewhere.

The possibility of exempting all port property from Municipal taxation as well as the question of levy of octroi duties by the Municipalities on goods imported may be examined by the State Governments. Ports bring trade and prosperity to towns which in turn could afford to encourage the ports in a little way.

(iv) *Financing of development works of Minor Ports.*—This will have to be either by free grants by the States or by interest-free loans repayable from revenue surpluses of future years. Having regard to the important role that the minor ports play in the transport system of the country, they can lay claim to such State assistance. An approximate idea of the amounts required for the development of minor ports is given below :

|  | Rs.          | Rs.                 |
|--|--------------|---------------------|
| (1) Purchase of dredgers—see para 14 . . . . . |              | 70.0 lakhs.         |
| (2) Purchase of tugs—see para 20 . . . . .     |              | 23.5 lakhs.         |
| (3) Development of works at Ports :—           |              |                     |
| Orissa . . . . .                               | 10.00 lakhs. |                     |
| Madras . . . . .                               | 25.0 lakhs.  |                     |
| Tuticorin . . . . .                            | 15.0 lakhs.  |                     |
| Travancore-Cochin . . . . .                    | 15.0 lakhs.  |                     |
| Bombay Ports . . . . .                         | 25.0 lakhs.  |                     |
| Okha . . . . .                                 | 20.0 lakhs.  |                     |
| Saurashtra excluding Bhavnagar . . . . .       | 20.0 lakhs.  |                     |
| Kutch Ports . . . . .                          | 25.0 lakhs.  |                     |
|  |              | <u>155.0 lakhs.</u> |
| GRAND TOTAL . . . . .                          |              | <u>248.5 lakhs.</u> |

or say Rs. 2.50 crores.

NOTE.—(1) Bhavnagar has been excluded as the cost of works there can be met out of the Reserve Fund.

(2) Immediate requirements only of Okha have been taken. The cost of an extra deep water berth is not included.

The ways and means of finding the finance required as above has to be considered at Government level.

## 26. ADMINISTRATION OF MINOR PORTS

The Minor Ports of India are subject to the administrative control of State Governments who have complete responsibility for the running of these Ports. Only one Minor Port, namely, Tuticorin, has been constituted into a Port Trust by an Act of the Madras Legislature. There is a Harbour Board for Okha, but this is not a statutory body and the Port comes under the Public Works Department of the Bombay Government. The

Ports are grouped into one or more groups according to the geographical position and other considerations. A detailed set up of the Ports in each State is given below :

## I. ORISSA

The Orissa Ports are formed into two groups, the first consisting of the Ports of Chandbali and Puri which are under the administrative control of the Collector of Balasore who administers the Orissa Ports Fund and is responsible to the Commerce and Labour Department of the Government of Orissa. The other group consists of Gopalpur which comes directly under the Revenue Commissioner of Orissa, with headquarters at Cuttack. Corresponding to the above, there are two Funds namely, the Orissa Ports Fund, covering Chandbali and Puri, and the Gopalpur Minor Port Fund, covering Gopalpur. The technical and executive work of these three Ports is in the hands of a Port Officer, Orissa Ports, with headquarters at Chandbali.

## II MADRAS

The Minor Ports of Madras, excluding the Tuticorin Port Trust, are grouped into five groups with headquarters at Kakinada, Cuddalore, Nagapattinam, Kozhikode (Calicut) and Mangalore. These five Port Officers are under the control of the Principal Port Officer, with headquarters at Madras. The services of the Port Officer, Tuticorin Port Trust, are also utilised for the management of the minor port of Kulasekharapattinam in Tinnivelly district. The local subordinates in charge of the other Minor Ports of Madras are designated as Port Conservators or Assistant Conservators and are responsible to the Port Officer of group concerned. The Principal Port Officer at Madras is assisted by an Assistant Civil Engineer and a Mechanical Engineer under the designation of Inspecting Dredging Engineer. Both these officers have their headquarters at Madras but tour the Ports periodically as and when required.

There is one common Provincial Minor Ports Fund and 15 different Landing and Shipping Fees Funds at all the important Minor Ports. There are also 4 Pilotage Funds. The Provincial Minor Ports Fund receives the port dues and fees under the Harbour Craft Rules. It is a single fund for all the Madras ports excluding Tuticorin. From the Fund is met the pay of the Port establishment, travelling allowance, navigational aids, maintenance of steam launches, buoys, moorings, flag staff and buildings at the Ports.

The Landing and Shipping Fees Funds are local for each individual place and the revenue consists of ground or storage rent, craneage and charges on cargo for landing or shipping. The expenses incurred in connection with or facilities for landing and shipping of goods are met from the Landing and Shipping Fees Fund of that Port. Tuticorin itself has two Funds, namely, the Tuticorin Port Fund and the Tuticorin Port Trust Fund, corresponding in functions to the Madras Port Fund and Madras Landing and Shipping Funds respectively.

At each of the five headquarters of the Port Officers, Port Conservancy Boards have been constituted. These are purely advisory bodies and are chosen from the business community, Chambers of Commerce, etc. The Tuticorin Port Trust comes directly under the Government of Madras. The budgets of the Port are approved by the Government. Sanction of the Government is also necessary for all works in excess of Rs. 25,000 in

each individual case. Sanction of the Government is also necessary to appropriation of funds between the two Funds at Tuticorin. The Port Officer, Tuticorin, who is an officer lent by the Madras Ports Department, is also the Secretary of the Tuticorin Port Trust.

### III. TRAVANCORE-COCHIN

The Travancore-Cochin Ports are administered by a Marine Department of the State under a Principal Port Officer, who is a class I Gazetted Officer of the State. His headquarters are at Alleppey which is the most important Port of the State. The Minor Ports other than Alleppey are in charge of Customs officials who are designated as Port Conservators responsible to the Principal Port Officer for all port matters. The Indian Ports Act has just been applied to the ports in Travancore-Cochin. No Port Fund has been constituted and the revenues and expenditure of the Ports are merged in the State finances with the exception of Landing and Shipping Fees Fund at Alleppey. This fund is administered by the Principal Port Officer with the assistance of a local Port Advisory Committee. Landing and shipping dues, ground rent, tug and lighter charges constitute the receipts for this Fund. The maintenance of the pier, trucks, cranes, tugs, etc., are provided from this Fund. The late Travancore Government had issued various rules and notifications for the administration and running of Ports, and these Acts and Rules are being revised on the lines of the Rules in force in Madras Ports. Works connected with the Ports, if any, are carried out by the Public Works Department of the State, the Chief Engineer, Public Works Department, Travancore-Cochin Government, being also the Engineer for the Ports.

### IV. BOMBAY

The Minor Ports of Bombay come under three groups, the first group consisting of the Ports of Bombay proper, the second group consisting of the ports in Saurashtra area, many of which were under the former Baroda State with the exception of Okha. The third is Okha Port.

The first group is administered through the Collector of Central Excise, Bombay, the second group by the Collector of Central Excise and Customs, Saurashtra, Jamnagar. The administration of the Port of Okha is carried out directly by the State Government through the Okha Harbour Board. There are two Funds namely, the Bombay Minor Ports Fund and Landing and Wharfage Fees Fund. The Central Excise Collectorate, Bombay, administers the two Funds on behalf of the Government of Bombay and the Customs staff collect port dues, wharfage fees and keep their account. In return for the services rendered, the Bombay Minor Ports Fund contributes Rs. 15,300 per annum and the Landing and Wharfage Fees Fund contributes Rs. 2,550 per annum to the Central Excise Collectorate.

The Bombay Minor Ports Fund derives its revenue from port dues levied on sea-going vessels. The expenditure is mainly on providing Light-houses, buoys, beacons, warning signals, etc. The Landing and Wharfage Fees Fund derives its income mainly from dues levied on passengers and collected by the Steamer Companies. The Landing and Wharfage Fees Fund is controlled by a Committee consisting of the Collector of Central Excise, as Chairman, the Deputy Secretary to the Government of Bombay, Public Works Department, Collectors of the Districts of Ratnagiri and Kolaba and representatives of the District Boards, Passenger Associations, Steamship Companies and the Deputy Superintendent of Light Houses, Bombay, as members.



The Port of Okha is administered by a Harbour Board at Bombay, directly coming under the Minister for Public Works Department, Bombay. The local administration at Okha is under a Port Officer, who is also the Harbour Master. He is assisted on the spot by an Assistant Harbour Master and a Harbour Engineer. The Harbour Engineer has a Marine Surveyor and a Mechanical Foreman under him. The last two are non-gazetted officers. There is a local Port Advisory Committee at Okha consisting of the representatives of the business community. Customs, dues at Okha are under a Superintendent of Customs, who is directly under the Collector of Customs, Saurashtra, Jamnagar. The finances of Okha Port are kept distinct and separate from the finances of other Bombay Ports.

## V. KUTCH

Out of the 7 Minor Ports in Kutch, two Ports namely, Tuna and Jhangr are under the Development Commissioner, Kandla, and the other five are under the State Government. These five Ports are grouped into one and placed under the executive control of a Port Commissioner and Engineer with headquarters at Bhuj, the capital of Kutch. The day-to-day administration of these five Ports along with the recoveries of Port dues and other charges is entrusted to the Customs Officials at each of the Ports to which they are ex-officio Conservators. The Indian Ports Act, the Bombay Landing and Wharfage Fees Act, Indian Lighthouses Act and other Acts have been applied to these Ports. The Port Fund Account has just been opened and all the port dues are credited to that Fund. There are no advisory bodies either centrally or at the Ports.

## VI. SAURASHTRA

The working Ports of Saurashtra, which come to about 29, are grouped into five divisions. Each of these five divisions is under a Port Officer with headquarters at Bhavnagar, Veraval, Portbunder, Bedi and Navalakhi. All these 5 Port Officers are under the control of an Administrative Officer and Chief Engineer (Ports) with headquarters at Rajkot, the capital of Saurashtra. The Port Officer at Bhavnagar is assisted by an Assistant Mechanical Engineer, an Assistant Civil Engineer, a Pilot, and a Traffic Assistant. Between Veraval and Portbunder, there is one Assistant Civil Engineer. Between Bedi and Navalakhi, there is one Assistant Civil Engineer and one Assistant Mechanical Engineer. The Administrative Officer at Headquarters, who is also ex-officio Secretary to the Department of Communications of the Saurashtra Government, is assisted by a Deputy Administrative officer (Traffic) and a Deputy Administrative Officer (Mechanical). There is also a Chief Accountant and a Stores Officer (Temporary). No funds have been formed. Charges on ships and cargo are levied according to the notifications issued, based mainly on the Bombay model. All revenues and expenditure including those relating to Pilotage are merged in State finances. There is one central Advisory Board at Rajkot to advise Government on matters of general interest and policy. There are 5 local Advisory Committees at the 5 headquarters of the Port officers.

## SUGGESTIONS REGARDING ADMINISTRATION

Before offering suggestions concerning individual States, the following general observations are made :

The policy of administering the Minor Ports through State Governments should continue for the present. Suggestions made in certain quarters that the Central Government should straightaway take over all the Minor

Ports under its direct administrative control is not recommended at present. The administrative difficulties will be many and there are no financial or other advantages. Whatever the practice in certain other countries may be, the extension of the system of railway management of Ports is also not recommended. The formation of a Port Trust at Tuticorin under the aegis of the State Government has been a great success, but the extension of this system to other places is not practicable or advantageous at present, except in the case of Mangalore. The formation of a Port Trust for Mangalore on the lines of the Tuticorin Port Trust is favoured by the Madras State and having examined the position, I agree that the Madras State may proceed to do so and take up the necessary legislation with the concurrence of the Central Government. Mangalore is a very well-developed place with a highly responsible business, industrial and commercial community, who are prepared and competent to shoulder the responsibilities of a Port Trust. For sometime, however, the Madras Government would have to permit its senior, technical and engineering officers to advise the new Trust Board when formed. The new Trust Board should also be enabled to start without handicaps, financial or otherwise. The cost of investigations now entrusted to the Poona Hydraulic Research Station should not also be made a burden on the new Port Trust. Thus, it is suggested that with the exception of Tuticorin and Mangalore, all other Minor Ports should continue to be administered by the respective State Governments. The case of Port Okha is dealt with separately.

With the above general remarks, I now proceed to make suggestions regarding new States.

#### ORISSA

The number of Ports is too few to form different groups. All the Orissa Ports could be grouped into one and placed under the Port Officer, Orissa. There is no advantage in placing the northern Ports under the Collector of Balasore. It is suggested that the Port Officer, Orissa, should be responsible for all the Ports in Orissa and come directly under the Revenue Commissioner, Cuttack or Bhubaneswar, as the case may be. The Revenue Commissioner should then take over the entire administration of the Minor Ports Fund. It is understood that a part of the Port Officer's salary is met by the Customs Department although no part of the Customs work is carried out by this officer. The justification for the continuance of this practice may be investigated and necessary action taken. The drawing up of a Port Manual or the compilation of Rules under the Acts should be taken in hand. The form of administration of Ports in Orissa may have to undergo a change, if and when inland waterways are developed and new Ports are opened in Orissa.

#### MADRAS

The system of administration in Madras is undoubtedly the best and is worthy of copying by other States. A Marine Survey Establishment with an Assistant Engineer and Overseer should be established as a permanent measure.

#### TRAVANCORE-COCHIN

A Port Fund should be formed as soon as possible to cover all the Ports of the State. The Alleppey Landing and Shipping Fees Fund will, however, continue to function at Alleppey as a separate entity. The Principal

Port Officer should preferably be a marine officer, but if suitable marine hands are not available, the post should be filled by a Civil Engineer.

There is no reason why landing and shipping fees should not be levied at Ports other than Alleppey.

## BOMBAY

No change in the Administrative set up is possible without unnecessarily increasing expenditure at Ports. The Bombay Minor Ports can hardly stand any further increase in expenditure. Engineering works at the Minor Ports of Bombay are carried out by the Bombay Public Works Department who it appears, charge a very high centage. The levy of this centage may be waived, if possible, and Port works treated as departmental works for this purpose. With regard to grouping of ports, it is suggested that the system in force prior to 1942, namely, of having two groups, one for the port south of Bombay and one for the ports north of Bombay, would be more suitable and advantageous for administration and development purposes. This will only mean the creation of two more funds. On the other hand, the administration and control of the former Baroda Ports in Kathiawar should ultimately be grouped with the Saurashtra Ports. (This remark does not apply to Okha). Whether this step will be possible immediately with the territories continuing to remain under Bombay but only ports coming under Saurashtra, is a matter which has got to be considered by the Governments concerned. Ports in Bombay as at present administered do not have the benefit of the advice by marine officers with regard to checking up of buoys, moorings, shoals, etc. For the present a periodical inspection by a marine officer, borrowed for the purpose, should be instituted.

## KUTCH

Detailed administration of the Ports in Kutch should be taken over by the Port Commissioner and Engineer as soon as possible. A start could be made with taking over Mandvi and later, the other ports. This step would be justified only when the 3 big Salt Works in the State get going. Periodical marine advice for Kutch ports should be made available by arrangement with the Kandla Port, who may also give the necessary advice regarding mechanical and marine engineering matters. There is no need to form a separate Port Fund and a Separate Landing and Shipping Fees Fund. One Port Fund general account would be sufficient until the trade at the ports reaches a sufficiently high level.

## SAURASHTRA

The administrative set up of Saurashtra ports appears to be excessively centralised. Whatever the reasons might have been in the past, there is no place for an Administrative Mechanical Officer at Rajkot. The correct place for him is at Bhavnagar and in fact, Mr. Hogan had made a similar recommendation. The practice of making the Administrative Officer also the Secretary to the Government does not appear to be a sound arrangement as he cannot both be a Head of Department responsible for the department and part of the Government Secretariat itself. The following revised set up would, in my opinion, be more efficient and at the same time cost no more than the existing expenditure.

*Headquarters.*—The headquarters staff may consist of an Administrative Officer assisted by a Personal Assistant. The Administrative Officer should either be an Engineer or a Traffic Officer. If he is an Engineer, he

should be assisted by a Traffic Officer. If he is a Traffic Officer, he should be assisted by an Engineer. The Accounts Officer will also have his headquarters at Rajkot. The total strength of Gazetted Officers at Headquarters will, therefore, be four. Between the Personal Assistant and the Engineer, they can attend to stores duties.

*Bhavnagar.*—The staff at Bhavnagar may consist of a Port Officer, a Pilot, a senior Mechanical Engineer (to be transferred from Rajkot), an Assistant Civil Engineer, an Assistant Mechanical/Electrical Engineer and a Traffic Assistant. The Port Officer, who is the senior-most marine officer in the State, should also be the Marine Adviser to the Saurashtra Government and should periodically visit the other important ports of Saurashtra. Similarly, the senior Mechanical Engineer should also be the Chief Mechanical Engineer for all the Ports and in that capacity, visit the other ports and be generally responsible to the Administrative Officer for the mechanical efficiency of all plant and craft. In addition to the above staff, at least one Marine Engineer with a 1st or 2nd class B.O.T. Certificate should be employed on the dredgers at Bhavnagar. The set up at the other ports namely, Verawal, Porbunder, Bedi and Navalakhi do not need any immediate change.

The following Funds should be started as soon as possible at Saurashtra. It should be possible to start these Funds by the 1st April 1952 and in any case not later than 1st April 1953. The proposed funds are :—

- (1) *The Saurashtra Ports Fund.*—To this will be credited all receipts from Port dues. All expenditure on maintenance of approaches, marking of channels, navigational aids, etc. will be charged to this Fund.
- (2) The Bhavnagar Pilotage Fund.
- (3) The Bhavnagar Landing and Wharfage Fees Fund.
- (4) Verawal Landing and Wharfage Fees Fund.
- (5) Porbunder Landing and Wharfage Fees Fund.
- (6) Bedi Landing and Wharfage Fees Fund.
- (7) Navalakhi Landing and Wharfage Fees Fund.

The Funds will also cover receipts and expenditure at the related sub-ports.

#### THE PORT OF OKHA

No change in the local administration of the Port is suggested. The Port Officer assisted by an Assistant Harbour Master, Engineering Officers and staff and by a local Advisory Committee can continue to manage the Port efficiently. Difficulties have, however, arisen with regard to higher Administration and Finance. The question as to which Government should administer the Port in future and how the required finances are to be secured is engaging the attention of the Central and Bombay Governments. An on-the-spot examination by me has convinced me that a non-recurring grant or loan of Rs. 20 lakhs and a recurring grant of Rs. 3 lakhs per annum to cover revenue deficits would be necessary to keep the Port going at its present level of utility, i.e. to be able to continue to handle  $3\frac{1}{2}$  to 4 lakhs of tons of traffic per year that is expected at this Port.

From the transport and All-India points of view it is essential that this FINEST-OF-ALL minor ports in India should be maintained without loss of existing capacity.

With regard to finding the finances and settling the future administration of this Port, it is suggested that the Port of Okha should continue to be administered by the Government of the State in which the Port area (Okha Mandal) is situated, *viz.*, Bombay at present. If as a result of re-adjustments of State boundaries at a later date, Okha Mandal area comes under Saurashtra, the Port would naturally go with it. With this main consideration in view, negotiations for financial adjustment between the Union and Bombay Governments for the continued maintenance and keeping open of Okha Port may be pursued. Local opinion is very strongly in favour of the Port continuing under Bombay Administration.

## 27. CO-ORDINATION BY UNION GOVERNMENT

Till very recently Ports were the sole responsibility of the State Governments and each State proceeded according to its own policies. Although there was a certain measure of uniformity in the former British Indian Provinces, a co-ordinated Port policy for the whole of India has become possible only now after the Integration of Part 'B' and 'C' States in the Union. Co-ordination is very essential to get the best out of the limited resources of the country; to exchange information, technical personnel, plant and craft, etc., between Ports and to avoid duplications and uneconomic constructions; to avoid wasteful competition etc. Such co-ordination should be brought about by the Central Government for which purpose a permanent Central Organization under the Ministry of Transport is necessary. This organization will, subject to the policies laid down by the Ministry on the advice of the National Harbour Board, be responsible for the following :—

- (i) Assisting the National Harbour Board on technical matters ;
- (ii) Technical Scrutiny of proposals for Port works and equipment made by State Governments and Port authorities ;
- (iii) Collecting and interchange of information and statistics between Ports.
- (iv) Offering expert advice and guidance to minor ports administrations.
- (v) Watching action taken on accepted recommendations of Special Committees and investigations.
- (vi) Supervision of Ports in Part 'C' and 'D' States which are directly under the Centre.
- (vii) Study of Port practice in foreign countries and making recommendations regarding their adoption in India wherever advantageous.
- (viii) Technical liaison with technical officers of Railway and Defence Ministries and Directorate of Shipping.
- (ix) Responsibility for such obligations as the Central Government may take upon itself such as Surveys, Coast preservation and protection etc.
- (x) To study and prepare a scheme for the formation and running of a Towage and Salvage Organisation for India.
- (xi) Generally assist the Ministry of Transport and/or the State Governments in Technical matters concerning Ports.

This Central Ports Organization should be under a Director who should be an Engineer with experience of Ports and Harbour constructions.

## 28. SUMMARY OF RECOMMENDATIONS

(1) The existing Minor Ports of India may be classified into Intermediate, Minor and sub-ports.

(2) An early decision should be taken regarding the construction and use of small size steam ships for the coastal trade.

(3) Defunct ports should be declared closed and Ministry of Transport should be consulted before new Ports are opened.

(4) Hydrographic Survey of Ports, Gulfs, creeks and river mouths on the coastline should be taken up. For this purpose, the Survey Wing of the Indian Navy should be strengthened and urgent work also entrusted to a firm of Surveyors.

(5) Two pools of dredgers, one at Madras and one at Saurashtra should be formed. The dredgers to be purchased for the Pools are detailed in para 14.

(6) Administrative authorities in charge of Ports should be asked to compile full statistics of the trade, shipping and finances of the important Ports and returns sent to the Ministry of Transport.

(7) The Intermediate Ports should be made use of in an increasing measure as distributing centres and coal depots.

(8) Country Craft industry must be fostered. Ports should provide facilities for their laying up, repairs, etc.

(9) The purchase of 8 additional tugs and some launches is recommended.

(10) Consideration may be given to the early construction of railway lines suggested in para. 21.

(11) Improvement of communications, roads and facilities for Customs examination, etc. should be taken up as per a plan to be prepared by the State Governments.

(12) Harbour Craft Rules should be drawn up and registering and licensing of Craft should be done by technically trained officers.

(13) A certain measure of uniformity in Port dues may be brought about.

(14) Proper accounting system should be introduced on a more or less uniform basis for all States. The question is one of urgency at Saurashtra.

(15) Capital and Depreciation Reserve Fund Accounts should be maintained separately from Revenue accounts of Port and Pilotage Funds.

(16) Finances of Bombay, Okha and Saurashtra Ports should be improved by enhancing the Landing and Wharfage fees. The Port development levy at Saurashtra should be discontinued by suitably raising the charges on cargo.

(17) The Tuticorin Port Fund and the Tuticorin Port Trust Fund may be combined and necessary legal enactments made.

(18) Ways and means for financing the Minor Ports to the tune of about Rs. 2.50 crores should be considered.

(19) Proposed changes in Administrative set up are detailed in para 26.

(20) The formation of a Port Trust for Mangalore and the starting of Port Funds by Travancore-Cochin and Saurashtra is recommended.

(21) The Port of Okha to continue under Bombay with suitable financial adjustments.

(22) Co-ordination and technical advice should be secured by the creation of a Central Ports Organisation.

(23) A number of recommendations concerning individual Ports is given in Part II.

In conclusion, I wish to thank the various State authorities, Customs and Port Officials and Shipping firms for giving me full facilities and co-operation for the conduct of the survey. But for their assistance it would not have been possible to complete the investigations in such a short time.

May, 1951.

S. NANJUNDIAH,

*Officer on special duty (Minor Ports),  
Ministry of Transport.*



## APPENDIX No. I

*List of places visited in the Course of Survey of Minor Ports*

| <i>States</i>         | <i>Headquarters of States</i> | <i>Ports visited</i>  | <i>Non-official bodies consulted</i>  |
|-----------------------|-------------------------------|---|---|
| I. West Bengal        | ...                           | ...   | ...   |
| II. Orissa            | Cuttack                       | Chandbali<br>Gopalpur<br>Calingapatam<br>Bhimlipatam<br>Kakinada  | Messrs Ripley & Co.<br>Port Conservancy Board<br>& Steamer Agents.  |
| III. Madras           | Madras                        | Cuddalore<br>Negapattinam<br>Tuticorin<br><br>Pamban<br>Mandapam<br>Dhanuskodi<br>Calicut                           | Sub-Committee of Port<br>Trust, The Indian<br>Chamber of Commerce,<br>Tuticorin.<br><br>Port Conservancy Board  |
| IV. Travancore-Cochin | Trivendrum                    | Baypore<br>Mangalore<br><br>Trivandrum<br>Quillon<br>Koiltthottam<br>Alleppey<br><br>Cochin (Major<br>Port)<br>Okha | Port Conservancy Board<br>Kanara Chamber of<br>Commerce,<br><br>Messrs F.X.Periera & Co.<br>Alleppey Chamber, of<br>Commerce, Travancore<br>Chamber of Commerce,<br>Landing & Shipping<br>Fund Committee, Alle-<br>ppey Port Contractors'<br>Association. |
| V. Bombay             | Bombay                        | Dwarka (Rupen)<br>Beyt<br>Marmagoa<br>Karwar<br>Bhavnagar   | Okha Port Advisory<br>Committee, Okha Cha-<br>mber of Commerce,<br>Tata Chemicals, Dwarka<br>Cement Works.  |
| VI. Saurashtra        | Rajkot                        | Verawal<br>Porbunder<br>Bedi<br>Sika<br>Navlakhi  | Saurashtra Chamber of<br>Commerce.<br>Local Port Adv. Comm.<br>Do. do.<br>Do. do.<br>Sika Cement Factory.<br>Morvi Chamber of Com-<br>merce.  |
| VII. Kutch            | Bhuj                          | Lakphat<br>Koteswar<br>Medi<br>Jakhau<br><br>Mandvi<br>Madva<br>Mundra<br><br>Kandla (Major<br>Port)                | Representative of Kutch<br>Salt & Chemicals Ltd.<br>Chamber of Commere<br>Representative of Bharat<br>Salt & Chemicals Works,<br>Ltd.   |



## Statistics relating to working of Minor Ports in Orissa State

|   | Chandbali   |           |           |           | Gopulpur   |                |         |          | Remarks  |
|---|---|-----------|-----------|-----------|------------|----------------|---------|----------|--|
|   | 1937-38   | 1938-39   | 1948-49   | 1949-50   | 1937-38    | 1938-39        | 1948-49 | 1949-50  |  |
| I. Traffic (Value in rupees)—                                     |   |           |           |           |            |                |         |          |  |
| (a) Imports . . . . .   | 9,51,743  | 8,60,905  | 11,76,552 | 15,50,483 | 3,34,071   | 1,98,314 C     | ..      | ..       | C—Coasting   |
| (b) Exports . . . . .   | 7,15,248  | 13,51,697 | 31,75,915 | 59,51,661 | 9,55,558   | 4,42,723 R     | ..      | ..       | P—Foreign  |
| (c) Total . . . . .   | 16,66,991   | 22,12,602 | 43,52,467 | 68,02,144 | 20,782     | 1,48,706 C     | ..      | ..       |  |
| II. Type of Cargo—  |   |           |           |           | 4,93,470   | 4,53,807       | ..      | ..       |  |
| (a) Imports . . . . .   | Kerosene Oil  |           | Salt      |           |            |                |         |          |  |
| (b) Exports . . . . .   | Paddy, rice, raw jute   |           |           |           |            |                |         |          |  |
| III. Shipping—  |   |           |           |           |            |                |         |          |  |
| (a) Foreign-going . . . . .                                       | ..  | ..        | ..        | ..        | 119        | 120            | ..      | ..       |  |
| (b) Coastal . . . . .   | 106   | 120       | 23        | 23        | T. 289,045 | 2,77,721       | ..      | ..       |  |
| (c) Country Craft . . . . .                                       | T. 51,092   | 57,842    | 5,000     | 7,260     | ..         | ..             | ..      | ..       |  |
| IV. Passenger Traffic . . . . .                                   | 14,891  | 13,814    | ..        | 20        | ..         | ..             | ..      | ..       |  |
| V. Finances—  |   |           |           |           | ..         | ..             | ..      | ..       |  |
| (a) Receipts . . . . .  | Rs. 3,443   | 5,151     | 18,374    | 22,986    | ..         | ..             | ..      | ..       |  |
| (b) Expenditure . . . . .   | Rs. 14,565  | 19,310    | 26,059    | 44,522    | 1,43,735   | 8,616          | 4,468*  | 4,492*   | The passenger traffic at Gopulpur was mainly to and from Burma and was spread over the whole year. |
| (c) Balances, if any, in reserve . . . . .                        | ..  | ..        | ..        | 3,726     | 3,878      | 1,36,456       | 5,622   | 5,992    | *These receipts are mainly interest on securities.   |
| VII. Port Facilities—   |   |           |           |           | ..         | ..             | ..      | 1,68,651 | As on 1st April 1950.  |
| (a) Berths . . . . .  | 4 Riverside Timber Jetties  |           |           |           | Nil        | Open Roadstead |         |          |  |
| (b) Cranes . . . . .  | Nil   |           |           |           | Nil        | Nil            |         |          |  |
| (c) Storage—{ Open . . . . .                                      | Ample   |           |           |           |            |                |         |          |  |
| (d) Other equipment . . . . .                                     | Two private godowns   |           |           |           |            |                |         |          |  |
| VIII. Port Charges—   | One Motor Launch  |           |           |           |            |                |         |          |  |
| (a) On ship . . . . .   | One Small Workshop  |           |           |           |            |                |         |          |  |
| (b) On cargo . . . . .  | As 4 per ton Port dues, plus Rs. 20 per vessel for mooring  |           |           |           |            |                |         |          |  |
|   | Rs. 1-80 per ton General Cargo.   |           |           |           |            |                |         |          |  |
|   | Rs. 0-2-0 per bag of rice.  |           |           |           |            |                |         |          |  |
|   | Rs. 0-0-3 per tin of Kerosene Oil.  |           |           |           |            |                |         |          |  |
| VIII. Industries . . . . .  | Rice Mills.   |           |           |           |            |                |         |          |  |
| IX. General Information—  |   |           |           |           |            |                |         |          |  |
| (a) Nearest railway station . . . . .                             | Bhadrak—34 miles.   |           |           |           |            |                |         |          |  |
| (b) Hinterland . . . . .  | Communications and transport.   |           |           |           |            |                |         |          |  |
| (c) Harbour data . . . . .  | Anchorages for deep draft ships about 38 miles off. Route between anchorage and Port tortuous. Strong tidal currents restrict river navigation to favourable tides. |           |           |           |            |                |         |          |  |
| X. Action proposed by State Authorities to develop Port . . . . . | The question of opening a major port in northeast Orissa coast either at Dharma or at Paradip is under investigation by the C.W.P.C.                                |           |           |           |            |                |         |          |  |
|   | Oil and Rice Mills: Sugar Factory at Aska and Saw Mills at Russelkonda. Jute and Hemp cleaning and baling.  |           |           |           |            |                |         |          |  |
|   | Berhampur—9 miles.  |           |           |           |            |                |         |          |  |
|   | Rich in Agricultural and Forest Produce. Railway line to Russelkonda will open up vast areas of virgin forest.  |           |           |           |            |                |         |          |  |
|   | Good, deep anchorage within six furlongs off coast line.  |           |           |           |            |                |         |          |  |
|   | An R. C. pier 1500', long was proposed, but has not been sanctioned.  |           |           |           |            |                |         |          |  |

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APPENDIX III  
Madras Minor Ports—Part I.—Important Ports

| Sl. No. | Name of Port | Years  | Traffic  |   |   | Passengers   |  |                                     | Shipping   |                                     |  |  | Finances  |   |   |   | Balances in L. & S. Funds on 1st April 1959                                 | Type of cargo imported or exported     | Rates charged  | Remarks   |   |
|---------|--------------|--|--|---|---|--|--|-------------------------------------|--|-------------------------------------|--|--|---|---|---|---|---|--|--|---|---|
|         |              |  | Imports  | Exports   | Total   | Foreign-<br>ing  | Dip-<br>omatic-<br>ing                                   | Foreign                             |  | Coasting                            |  | Country Craft                          |   | Port Fund   |   | L. & S. Fund  |   |  |  |   |   |
|         |              |  |  |   |   |  |  | No.                                 | Tonnage  | No.                                 | Tonnage  | No.                                    | Tonnage   | Receipts  | Ex-<br>penditure  | Receipts  |   |  |  |   | Ex-<br>penditure                                |
| 1       | Kakimada     | 1936-37<br>1937-38<br>1938-39<br>1947-48<br>1948-49<br>1949-50 | (Tons)<br>21,88,254<br>2,81,15,025<br>1,88,58,088<br>1,036<br>2,936<br>5,868 | (Tons)<br>73,86,664<br>90,23,602<br>1,98,55,236<br>37,253<br>58,807<br>58,587 | (Tons)<br>97,68,878<br>3,71,40,627<br>3,17,13,334<br>38,289<br>61,743<br>64,455 | 11,206<br>10,121<br>9,737<br>12,207<br>...<br>...      | 12,206<br>11,984<br>...<br>...<br>...<br>...             | 115<br>90<br>114<br>33<br>44<br>56  | 442,942<br>3,66,591<br>2,21,493<br>1,31,223<br>1,88,616<br>2,20,146  | 124<br>110<br>114<br>10<br>30<br>37 | 3,53,026<br>3,07,663<br>3,09,791<br>27,888<br>1,03,331<br>97,674 | 12<br>8<br>14<br>84<br>53<br>19        | 2,061<br>1,092<br>2,861<br>9,580<br>7,189<br>2,739  | Rs.<br>1,08,900<br>1,08,950<br>99,000<br>63,555<br>89,784<br>1,00,776 | Rs.<br>29,383<br>29,938<br>35,898<br>76,411<br>65,231<br>66,132 | Rs.<br>3,28,607<br>3,26,912<br>3,41,143<br>1,12,213<br>1,37,511<br>2,46,882 | Rs.<br>1,65,137<br>2,63,250<br>2,37,894<br>2,18,468<br>2,37,949<br>2,15,371 | ...<br>...<br>...<br>...<br>...<br>... | Import of petrol, K. oil, fuel oil etc., and groundnut, rice, paddy, and other goods. These formed the bulk of the trade of the port before war. Present exports are Rice or paddy & Tobacco. Imports—General. | Port dues according to Port, Madras Minor Ports, No. 1 of 1929-30 and charges for use of port according to Port Schedule of charges fixed for each commodity at this Port. No privilege at this Port. | Highest traffic in 1929-30. Value Rs. 5 crores. |
| 2       | Masulipatnam | 1936-37<br>1937-38<br>1938-39<br>1947-48<br>1948-49<br>1949-50 | 6,062<br>5,770<br>3,576<br>111<br>245<br>733                                 | 1,22,790<br>1,85,192<br>2,27,124<br>13,089<br>36,758<br>30,547                | 1,28,852<br>1,90,962<br>2,31,600<br>13,919<br>36,970<br>31,280                  | ...<br>...<br>...<br>...<br>...<br>...                 | ...<br>...<br>...<br>...<br>...<br>...                   | 47<br>57<br>68<br>2<br>...<br>...   | 1,88,498<br>2,31,072<br>2,75,404<br>7,714<br>...<br>...              | 33<br>32<br>20<br>4<br>5<br>4       | 1,08,287<br>95,166<br>60,613<br>12,164<br>15,986<br>14,077       | 35<br>24<br>31<br>106<br>62<br>21      | 3,663<br>2,892<br>3,500<br>11,239<br>7,988<br>2,612 | Not available.<br>3,29,913<br>40,195<br>10,822<br>6,703<br>4,645      | Rs.<br>16,185<br>15,726<br>16,669<br>20,715<br>13,056<br>16,200 | Rs.<br>36,951<br>9,502<br>8,419<br>17,250<br>6,304<br>11,491                | ...<br>...<br>39,860<br>...<br>...<br>...                                   | Imports—General cargo.                 | Do.  | Exports—Rice, paddy, groundnuts, oil cakes.   |   |
| 3       | Raddah       | 1936-37<br>1937-38<br>1938-39<br>1947-48<br>1948-49<br>1949-50 | 16,60,997<br>25,27,311<br>17,42,684<br>37,495<br>1,16,773<br>1,17,318        | 2,00,66,015<br>1,51,37,442<br>1,44,57,921<br>9,350<br>4,368<br>12,338         | 2,17,26,112<br>1,76,64,753<br>1,62,00,585<br>46,845<br>1,21,141<br>1,30,150     | 146<br>183<br>113<br>...<br>...<br>...                 | 335<br>258<br>310<br>...<br>...<br>...                   | 105<br>95<br>110<br>11<br>22<br>... | 438,499<br>3,91,596<br>4,54,853<br>47,113<br>84,018<br>...           | 68<br>61<br>66<br>5<br>13<br>40     | 2,88,775<br>1,81,723<br>1,90,395<br>17,997<br>41,593<br>1,34,184 | 58<br>73<br>89<br>133<br>90<br>124     | 1,998<br>2,346<br>3,237<br>5,415<br>4,152<br>6,277  | Rs.<br>44,905<br>34,916<br>35,817<br>19,695<br>34,281<br>36,797       | Rs.<br>19,829<br>18,611<br>19,861<br>40,641<br>39,724<br>31,598 | Rs.<br>85,538<br>80,272<br>89,673<br>68,977<br>62,390<br>1,04,562           | Rs.<br>97,101<br>71,741<br>75,185<br>68,977<br>62,390<br>1,04,562           | ...<br>...<br>...<br>...<br>...<br>... | Imports—Coal, Betelnuts, timber, food-grains.  | Do.   | Imports—Betelnuts & Miscellaneous.              |
| 4       | Nagapattinam | 1936-37<br>1937-38<br>1938-39<br>1947-48<br>1948-49<br>1949-50 | 55,31,924<br>60,01,994<br>51,32,967<br>6,898<br>3,190<br>4,366               | 1,19,83,398<br>1,83,93,065<br>1,12,67,467<br>2,540<br>7,109<br>4,092          | 1,75,15,322<br>1,83,93,065<br>1,64,00,434<br>9,438<br>10,299<br>8,458           | 34,516<br>58,807<br>26,074<br>19,346<br>9,333<br>7,024 | 23,665<br>29,519<br>38,339<br>15,064<br>11,430<br>10,990 | 91<br>97<br>89<br>52<br>42<br>39    | 3,88,124<br>4,21,074<br>3,85,127<br>1,76,989<br>1,55,818<br>1,96,358 | 68<br>65<br>68<br>...<br>...<br>... | 2,08,625<br>1,92,078<br>1,07,463<br>...<br>...<br>...            | 182<br>168<br>169<br>...<br>...<br>... | 5,405<br>5,977<br>7,031<br>7,757<br>8,861<br>5,74   | Rs.<br>40,033<br>42,489<br>41,407<br>13,349<br>11,350<br>6,063        | Rs.<br>63,506<br>27,953<br>31,465<br>17,947<br>25,855<br>26,126 | Rs.<br>47,115<br>53,478<br>49,941<br>29,290<br>20,897<br>42,866             | ...<br>...<br>...<br>...<br>...<br>...                                      | Imports—Rice, paddy, and other goods.  | Do.  | Imports—Rice, paddy, and other goods.   |   |

## APPENDIX II—contd.

## Madras Minor Ports—Part I—Important Ports

| Sl. No. of Port | Name of Port | Years    | Traffic     |             |             | Passengers  |                  |          |          | Shipping |          |               |           | Finances     |          |          |               | Balances in the L. & S. Funds on 1st April 1950                         | Type of cargo imported or exported  | Rates charged   | Remarks |
|-----------------|--------------|----------|-------------|-------------|-------------|-------------|------------------|----------|----------|----------|----------|---------------|-----------|--------------|----------|----------|---------------|---|---|---|---------|
|                 |              |          | Imports     | Exports     | Total       | Embark- ing | Dis- embark- ing | Foreign  |          | Coasting |          | Country Craft | Port Fund | L. & S. Fund |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  | No.      | Tonnage  | No.      | Tonnage  |               |           | No.          | Tonnage  | Rs.      | Ex- penditure |   |   |   |         |
| 5               | Kozhikode    | 1936-37  | (Tons)      | (Tons)      | (Tons)      |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              | 1937-38  | 2,433,186   | 3,434,958   | 5,868,144   | 611         | 601              | 71       | 2,19,600 | 122      | 1,35,339 | 2609          | 94,203    | 1,23,486     | 26,640   | 86,172   | 60,801        | ...   | Imports—Foodgrains, dates, K. oil, cotton piecegoods.   | No. Pilgrage at the Port dues Rs. 100. Pilgrage Fund called the Azhakar-Kozhikode Pilgrage fund—the set- tle being for the Bopore wharves.  |         |
|                 |              | 1938-39  | 2,91,10,077 | 3,48,97,135 | 6,40,07,212 | 396         | 312              | 68       | 2,04,500 | 104      | 1,61,511 | 2829          | 1,05,922  | 1,13,219     | 31,268   | 1,00,122 | 92,057        | ...   |   |   |         |
|                 |              | 1947-48  | 2,68,52,599 | 3,19,94,377 | 5,88,46,986 | 246         | 384              | 61       | 1,80,800 | 100      | 1,60,526 | 1099          | 76,867    | 1,07,604     | 31,395   | 1,15,590 | 76,061        | ...   | Exports—Tea, Pepper, Timber, oil, copra, coffee, ginger.  |   |         |
|                 |              | 1948-49  | 33,393      | 32,301      | 65,694      | 121         | 151              | 16       | 50,637   | 106      | 1,67,180 | 1115          | 83,734    | 1,12,665     | 9,214    | 1,60,270 | 1,71,460      | ...   |   |   |         |
| 6               | Mangalore    | 1949-50  | 28,519      | 1,14,584    | 1,43,103    | 30          | 208              | 32       | 80,437   | 162      | 2,04,852 | 1244          | 96,875    | 1,04,289     | 47,813   | 1,66,896 | 1,36,338      | ...   | Imports—Ricegods, firewood, Salt, dry fruits, millets, oil vegetables.                          | Port dues according to the Madras Minor Ports Notification. Landing & shipping dues & charges for use of the Port according to the Port Schedule at the port. The Mangalore Pilgrage Fund is for service at Mangalore only. |         |
|                 |              | 1936-37  | 36,565      | 1,10,301    | 1,56,866    | 35          | 130              | 22       | 65,202   | 267      | 3,18,690 | 903           | 1,07,145  | 3,68,400     | 23,761   | 78,702   | 1,66,905      | ...   |   |   |         |
|                 |              | 1937-38  | ...         | ...         | ...         | 7355        | 6532             | 192      | 3,51,223 | 2970     | 1,99,070 | 2970          | 1,99,070  | 3,06,222     | 27,285   | 81,028   | 27,470        | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Mangalore Pilgrage Fund is for service at Mangalore only.  |         |
|                 |              | 1938-39  | ...         | ...         | ...         | 9272        | 7827             | 179      | 3,86,748 | 3168     | 1,48,607 | 3168          | 1,48,607  | 3,47,715     | 68,023   | 1,10,079 | 1,10,474      | ...   |   |   |         |
|                 |              | 1947-48  | 99,90,083   | 1,39,61,153 | 2,39,52,236 | 9373        | 6012             | 155      | 3,19,293 | 2905     | 1,24,517 | 2905          | 1,24,517  | 41,478       | 44,790   | 1,61,815 | 1,18,556      | ...   | Exports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Mangalore Pilgrage Fund is for service at Mangalore only.  |         |
| 7               | Tuticorin    | 1947-48  | ...         | ...         | ...         | 8,000       | 5,887            | 81       | 1,00,995 | 3433     | 1,61,205 | 622           | 39,105    | 47,892       | 39,540   | 1,74,838 | 2,28,325      | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust.   |         |
|                 |              | 1948-49  | 80,983      | 1,79,237    | 2,60,220    | 4,263       | 5,158            | 74       | 1,13,420 | 394      | 36,808   | 394           | 36,808    | 1,53,686     | 47,581   | 3,90,275 | 3,54,513      | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust.   |         |
|                 |              | 1949-50  | 74,493      | 2,51,753    | 3,26,246    | 4,263       | 5,158            | 74       | 1,13,420 | 394      | 36,808   | 394           | 36,808    | 1,53,686     | 47,581   | 3,90,275 | 3,54,513      | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust.   |         |
|                 |              | 1936-37  | 1,35,627    | 1,42,692    | 5,01,319    | 48,904      | 40,276           | 106      | 4,13,705 | 444      | 1,15,691 | 570           | 56,746    | 1,22,229     | 68,592   | 3,35,588 | 2,23,709      | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust.   |         |
|                 |              | 1937-38  | 1,37,303    | 1,46,967    | 5,20,270    | 58,747      | 43,480           | 102      | 3,77,871 | 352      | 8,08,586 | 570           | 56,746    | 1,22,229     | 68,592   | 3,35,588 | 2,23,709      | ...   | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom.                         | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust.   |         |
| Tuticorin       | 1938-39      | 1,35,627 | 1,42,692    | 5,01,319    | 48,904      | 40,276      | 106              | 4,13,705 | 444      | 1,15,691 | 570      | 56,746        | 1,22,229  | 68,592       | 3,35,588 | 2,23,709 | ...           | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom. | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust. |   |         |
|                 | 1947-48      | 1,54,599 | 77,802      | 2,32,401    | 20,793      | 21,335      | 31               | 1,23,821 | 184      | 3,35,549 | 570      | 56,746        | 1,22,229  | 68,592       | 3,35,588 | 2,23,709 | ...           | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom. | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust. |   |         |
|                 | 1948-49      | 2,85,287 | 83,859      | 3,69,146    | 16,024      | 18,417      | 69               | 2,80,017 | 247      | 4,32,383 | 570      | 56,746        | 1,22,229  | 68,592       | 3,35,588 | 2,23,709 | ...           | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom. | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust. |   |         |
|                 | 1949-50      | 2,58,717 | 1,67,386    | 4,26,103    | 6,951       | 9,983       | 75               | 2,93,349 | 339      | 3,86,232 | 570      | 56,746        | 1,22,229  | 68,592       | 3,35,588 | 2,23,709 | ...           | Imports—Tea, coffee, cashewnut, timber, copra, pepper, ginger cardamom. | Port dues—Landing & shipping dues. At 3 per ton. The Tuticorin Port is managed by a Port Trust. |   |         |
|                 | per cent     | 37.0     |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   |   |         |
|                 |              |          |             |             |             |             |                  |          |          |          |          |               |           |              |          |          |               |   |   | </  |         |

Total tonnage handled at the seven important minor ports of Madras in 1948-49 10,02,222 tons  
Total tonnage handled at the seven important minor ports of Madras in 1949-50 11,43,604 tons

|              |       |          |
|--------------|-------|----------|
| Tuticorin    | 37.0  | per cent |
| Mangalore    | 27.0  |          |
| Kozhikode    | 14.2  |          |
| Calicut      | 11.5  |          |
| Kaduna       | 6.0   |          |
| Mandapam     | 3.3   |          |
| Nagapattinam | 0.5   |          |
|              | 100.0 |          |

**APPENDIX IV**  
**Madras Minor Ports—Part II.—Ports of less importance**

| Serial No. | Name of Port              | Years   | Traffic               |          |          | Passengers |                | Shipping |          |         |          | Country Craft |        | Finance   |             | Type of cargo  | General Remarks  |  |   |  |
|------------|---------------------------|---------|-----------------------|----------|----------|------------|----------------|----------|----------|---------|----------|---------------|--------|-----------|-------------|--|--|--|---|--|
|            |                           |         | Imports               | Export   | Total    | Em-barking | Dis-em-barking | Foreign  |          | Coastal |          | No.           | Tons   | Receipts  | Expenditure |  |  |  |   |  |
|            |                           |         |                       |          |          |            |                | No.      | Tonnage  | No.     | Tonnage  |               |        |           |             |  |  |  |   |  |
| 1.         | Calicutport]              | 1937-38 | T. 955                | 19,040   | 19,995   | 3,231      | 2,712          | 12       | 42,741   | 105     | 2,49,246 | ...           | ...    | Rs. 6,180 | Rs. 10,293  | Exports—Groundnut, Jute.   |  |  |   |  |
|            |                           | 1938-39 | 366                   | 18,800   | 18,856   | 2,950      | 3,293          | 9        | 35,975   | 104     | 2,24,319 | ...           | ...    | Rs. 6,234 | Rs. 4,718   |  |  |  |   |  |
|            |                           | 1948-49 | ...                   | 811      | 811      | ...        | ...            | ...      | ...      | 1       | 4,243    | ...           | ...    | Rs. 1,203 | Rs. 5,767   |  |  |  |   |  |
|            |                           | 1949-50 | ...                   | 2,340    | 2,340    | ...        | ...            | ...      | ...      | 6       | 21,570   | ...           | ...    | Rs. 1,205 | Rs. 5,964   |  |  |  |   |  |
|            |                           | 1937-38 | ...                   | 31,356   | 31,356   | ...        | ...            | ...      | ...      | 20      | 75,529   | 6             | 11,957 | ...       | ...         |  |  | Rs. 13,322   | Rs. 4,641                                   |  |
| 2.         | Bheemampattanam           | 1938-39 | ...                   | 46,969   | 46,969   | ...        | ...            | ...      | ...      | 24      | 91,218   | 2             | 6,594  | ...       | ...         | Rs. 14,871   | Rs. 3,601  | Exports—Jute, Groundnuts, Mynobolus Niger seed, Hemp, Palmyra fibre. |   |  |
|            |                           | 1948-49 | ...                   | 4,542    | 4,542    | ...        | ...            | ...      | ...      | 6       | 25,171   | 1             | 3,424  | ...       | ...         | Rs. 6,793  | Rs. 4,438  |  |   |  |
|            |                           | 1949-50 | ...                   | 4,834    | 4,834    | ...        | ...            | ...      | ...      | 2       | 6,182    | 7             | 24,393 | ...       | ...         | Rs. 6,490  | Rs. 4,852  |  |   |  |
|            |                           | 1937-38 | Ra. 3,33,221          | 2,35,594 | 5,68,815 | 2,309      | 909            | 49       | 2,31,813 | ...     | ...      | ...           | 53     | 1,912     | 4,732       | 1,826  | Exports—Rice, Onions, Earthenware. Imports—Rennins, Sugar, logs. |  |   | There appears to be no prospect of trade improving at this Port. |
|            |                           | 1938-39 | 3,27,461              | 1,56,894 | 4,84,355 | 1,119      | 977            | 51       | 2,36,566 | ...     | ...      | ...           | 60     | 2,351     | 2,631       | 1,977  |  |  |   |  |
| 3.         | Port Novo                 | 1948-49 | T. 641                | 498      | 1,339    | ...        | ...            | ...      | ...      | ...     | ...      | ...           | 32     | 1,384     | 1,826       | 2,519  | 1,884  | Imports—Rennins, Sugar, logs.  | Port of little or no importance at present. |  |
|            |                           | 1949-50 | 682                   | 376      | 1,058    | ...        | ...            | ...      | ...      | ...     | ...      | ...           | 43     | 911       | 334         | 2,311  | ...  |  |   |  |
|            |                           | 1937-38 | 3,097                 | 3,344    | 6,441    | ...        | ...            | ...      | ...      | 1       | 1,896    | 8             | 24,671 | 107       | 3,443       | 754  | ...  |  |   |  |
|            |                           | 1938-39 | 3,295                 | 4,655    | 7,950    | ...        | ...            | ...      | ...      | ...     | ...      | 10            | 32,397 | 145       | 4,658       | 2,126  | ...  |  |   |  |
|            |                           | 1948-49 | 509                   | 164      | 673      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | 38     | 826       | 896         | 1,830  | ...  |  |   |  |
| 4.         | Thirunallivayal           | 1949-50 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | ...  | Used to export rice to Cochin.                                       |   |  |
|            |                           | 1937-38 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | ...  |  |   |  |
|            |                           | 1938-39 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | ...  |  |   |  |
|            |                           | 1948-49 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | ...  |  |   |  |
|            |                           | 1949-50 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | ...  |  |   |  |
| 5.         | Adirampattanam            | 1937-38 | Very small quantities |          |          | 7          | 137            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | Do.  |  |   |  |
|            |                           | 1938-39 | ...                   |          |          | 22         | 147            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  |   |  |
|            |                           | 1948-49 | ...                   |          |          | 35         | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  |   |  |
|            |                           | 1949-50 | ...                   |          |          | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  |   |  |
|            |                           | 1937-38 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  | ...   |  |
| 6.         | Toppurattal Polat Calicut | 1938-39 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | Imports—Limestone logs, Exports—Rice.                            | Do.  |   |  |
|            |                           | 1948-49 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  |   |  |
|            |                           | 1949-50 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  |   |  |
|            |                           | 1937-38 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  | ...   |  |
|            |                           | 1938-39 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  | ...   |  |
| 7.         | Tondl                     | 1948-49 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  | Used to import Burma Teak and rice.                              | Do.  |   |  |
|            |                           | 1949-50 | ...                   | ...      | ...      | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | ...  |  |  | ...   |  |
|            |                           | 1937-38 | Ra. 3,65,744          | 73,642   | 4,43,886 | 1          | 23             | ...      | ...      | 6       | 11,207   | 119           | 5,161  | 1,971     | 1,293       | There appears to be no prospect of trade improving at this Port. |  |  |   |  |
|            |                           | 1938-39 | 4,54,975              | 67,434   | 5,22,409 | 12         | ...            | ...      | ...      | 6       | 10,341   | 82            | 4,259  | 1,727     | 2,041       |  |  |  |   |  |
|            |                           | 1948-49 | T. 275                | 52       | 327      | 67         | 126            | ...      | ...      | ...     | ...      | 39            | 527    | 271       | 3,806       |  |  |  |   |  |
| 1949-50    | ...                       | ...     | ...                   | 8        | 23       | ...        | ...            | ...      | ...      | ...     | ...      | ...           | ...    | ...       | ...         | 3,758  |  |  |   |  |

**APPENDIX IV—contd.**  
**Madras Minor Ports—Part II.—Ports of less importance**

| Serial No. | Name of Port        | Years                                    | Traffic  |  |  | Passengers                                   |  | Shipping      |                        |                         |                                   | Country Craft            |                                      | Finance                                |                                     | Type of cargo  | General Remarks  |
|------------|---------------------|--|--|--|--|--|--|---------------|------------------------|-------------------------|-----------------------------------|--------------------------|--------------------------------------|--|-------------------------------------|--|--|
|            |                     |  | Imports  | Exports  | Total  | Em-<br>bar-<br>king                          | Disem-<br>bar-<br>king                       | Foreign       |                        | Coastal                 |                                   | No.                      | Tons                                 | Receipts                               | Expenditure                         |  |  |
|            |                     |  |  |  |  |  |  | No.           | Tonnage                | No.                     | Tonnage                           |                          |                                      |  |                                     |  |  |
| 8          | Devipattanam        | 1937-38<br>1938-39<br>1948-49<br>1949-50 | (Tons)<br>14,343<br>4,620<br>3,060<br>9,146        | (Tons)<br>58,539<br>41,574<br>2,482<br>6,745   | (Tons)<br>72,882<br>46,191<br>5,542<br>15,891    | 28<br>7<br>17<br>2                           | 10<br>7<br>48<br>5                           | ...           | ...                    | ...                     | ...                               | 42<br>57<br>48<br>99     | 1,117<br>1,978<br>480<br>3,424       | Rs.<br>63<br>66<br>118<br>272          | Rs.<br>...<br>...<br>1,524<br>1,438 | ...  | ...  |
| 9          | Punban              | 1937-38<br>1938-39<br>1948-49<br>1949-50 | 72,112<br>5,098<br>384<br>180                      | 76,978<br>2,540<br>2,692<br>3,158              | 1,49,090<br>7,638<br>3,076<br>3,338              | ...  | ...  | ...           | ...                    | 11<br>13<br>7<br>9      | 11,200<br>8,290<br>1,904<br>1,024 | 242<br>249<br>128<br>263 | 11,158<br>17,287<br>5,742<br>9,730   | 2,351<br>1,896<br>1,028<br>1,074       | 4,479<br>4,814<br>8,333<br>9,403    | Imports—Rice, salt, Live<br>truffles.<br>Exports—Fish & fish products.                                 | This place is important as it<br>forms a link between the<br>Gulf of Mannar and the<br>Palk Bay. It has a separate<br>Pilgrage service & Fuel.   |
| 10         | Dhanushkodi         | 1937-38<br>1938-39<br>1948-49<br>1949-50 | Not available.<br>6,421<br>2,362                   | Not available.<br>19,514<br>11,013             | Not available.<br>25,935<br>13,375               | 1,24,417<br>1,29,809<br>1,82,213<br>1,54,447 | 1,34,974<br>1,35,251<br>1,68,485<br>1,40,809 | ...           | ...                    | Not avail-<br>able.     | ...                               | 43<br>40<br>18<br>24     | 668<br>833<br>181<br>249             | 1,671<br>1,874<br>2,460<br>2,445       | 2,026<br>2,296<br>3,700<br>3,662    | Imports—Araca nut, hides &<br>skins.<br>Exports—Dried fish, onions,<br>vegetables, cotton piece-goods. | This place is the terminus of<br>the Southern Railway on<br>the Indo-Ceylon rail route<br>from Karaikal & Talaimana-<br>rasi Pier and is very impor-<br>tant on account of heavy<br>passenger traffic. |
| 11         | Kulabari            | 1937-38<br>1938-39<br>1948-49<br>1949-50 | Not available.<br>755<br>690                       | Not available.<br>5,465<br>4,239               | Not available.<br>6,220<br>4,929                 | ...  | ...  | ...           | ...                    | ...                     | ...                               | 213<br>209<br>233<br>240 | 11,449<br>10,632<br>12,349<br>11,048 | Not<br>avail-<br>able.<br>856<br>2,400 | ...                                 | 717<br>2,462   | Imports—Charas, timber and<br>tiles.<br>Exports—Firewood.  |
| 12         | Kulasekharapattanam | 1937-38<br>1938-39<br>1948-49<br>1949-50 | Not available.<br>678<br>466                       | Not available.<br>1,481<br>2,138               | Not available.<br>2,159<br>2,604                 | ...  | ...  | ...           | ...                    | ...                     | ...                               | 185<br>186               | 10,424<br>12,318                     | Not<br>avail-<br>able.<br>...          | ...                                 | ...  | Imports—Timber & tiles.<br>Exports—Salt, bakewell, man.  |
| 13         | Ponnani             | 1937-38<br>1938-39<br>1948-49<br>1949-50 | Rs. 20,46,499<br>21,75,039<br>8,02,005<br>8,69,064 | 10,74,190<br>7,89,828<br>7,87,468<br>18,11,580 | 31,20,689<br>29,64,867<br>25,89,473<br>26,20,644 | ...  | ...  | 3<br>3<br>... | 12,398<br>8,035<br>... | 127<br>109<br>28        | 2,71,964<br>2,47,114<br>20,070    | 310<br>259<br>272        | 15,163<br>12,595<br>17,942           | 5,209<br>4,830<br>3,672                | 1,734<br>13,294<br>2,206            | Imports—Rice, salt, fish<br>bundles, dore.<br>Exports—Coconuts, oil,<br>Timber, tiles.                 |  |
| 14         | Badapora            | 1937-38<br>1938-39<br>1948-49<br>1949-50 | Rs. 14,85,962<br>15,50,948<br>2,115<br>2,483       | 35,35,499<br>37,02,732<br>1,16,108<br>12,187   | 50,21,461<br>52,53,680<br>20,223<br>14,670       | 91<br>26<br>11<br>4                          | 12<br>9<br>1<br>...                          | ...           | ...                    | 154<br>139<br>61<br>109 | ...                               | 419<br>464<br>85<br>14   | ...                                  | ...                                    | ...                                 | Imports—Salt.<br>Exports—Coconuts, Copra<br>& pepper.  |  |

This place is important as it forms a link between the Palk Bay. It has a separate Pilotage service & Fund.

This place is the terminus of the Southern Railway on the Madras-Tamil Nadu line with ferry service between Dhanushkodi & Talaimuttar Pier and is very important on account of heavy passenger traffic.

| Serial No. | Name of Port | Years   | Traffic        |                |           | Passengers     |                   | Shipping |         |         |          | Country Craft |        | Finance  |             | Type of cargo  | General Remarks                         |  |   |
|------------|--------------|---------|----------------|----------------|-----------|----------------|-------------------|----------|---------|---------|----------|---------------|--------|----------|-------------|--|---|--|---|
|            |              |         | Imports        | Exports        | Total     | Em-<br>barking | Disem-<br>barking | Foreign  |         | Coastal |          | No.           | Tons   | Receipts | Expenditure |  |   |  |   |
|            |              |         |                |                |           |                |                   | No.      | Tonnage | No.     | Tonnage  |               |        |          |             |  |   |  |   |
| 15.        | Kallayi      | 1937-38 | (Tons).        | (Tons).        | (Tons).   | ...            | ...               | ...      | ...     | ...     | ...      | 62            | 2,642  | Rs.      | Rs.         | Imports—Tiles.<br>Exports—Coconuts<br>and<br>Mango plants.                                     | The Port is closed to Mail<br>(French). |  |   |
|            |              | 1938-39 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | 89            | 4,358  | 216      | 504         |  |   |  |   |
|            |              | 1948-49 | 592            | 1,555          | 2,147     | ...            | ...               | ...      | ...     | ...     | ...      | 61            | 3,109  | 284      | 1,463       |  |   |  |   |
|            |              | 1949-50 | 769            | 1,255          | 2,024     | ...            | ...               | ...      | ...     | ...     | ...      | 77            | 2,963  | 235      | 1,490       |  |   |  |   |
|            |              | 1937-38 | Not available. | Not available. | ...       | 87             | 48                | 33       | 71,471  | 168     | 3,36,701 | 530           | 23,472 | 25,772   | 21,259      |  |   |  |   |
| 16.        | Tellicherry  | 1938-39 | Not available. | Not available. | ...       | 28             | 11                | 29       | 61,731  | 131     | 2,98,641 | 535           | 25,055 | 23,584   | 16,997      | Imports—Salt, salted fish, tiles<br>and Genl. cargo.<br>Exports—Coconuts<br>pepper and Timber. | Used to be all-weather Port.            |  |   |
|            |              | 1948-49 | 6,904          | 3,147          | 10,051    | ...            | ...               | ...      | ...     | ...     | ...      | 189           | 13,932 | 10,159   | 16,796      |  |   | 18,209   |   |
|            |              | 1949-50 | 8,103          | 4,640          | 12,743    | ...            | ...               | 1        | 3,651   | 59      | 39,891   | 182           | 13,358 | 12,732   | 3,672       |  |   |  |   |
|            |              | 1937-38 | Rs. 54,92,990  | 5,23,971       | 60,16,961 | 179            | 607               | ...      | ...     | 215     | 3,84,248 | 304           | 15,241 | 6,864    | 7,401       |  |   | 7,262  |   |
|            |              | 1938-39 | 60,66,985      | 15,79,687      | 75,86,672 | 125            | 394               | ...      | ...     | 177     | 3,50,883 | 360           | 15,872 | 7,401    | 3,318       |  |   | 7,262  |   |
| 17.        | Cannore      | 1948-49 | T.             | 3,070          | 1,684     | 4,754          | 111               | 135      | ...     | ...     | ...      | 98            | 7,401  | 7,401    | 7,401       | Imports—Salt<br>Exports—Timber.  | Deep water in river.                    |  |   |
|            |              | 1949-50 | 5,219          | 1,701          | 6,920     | 105            | 84                | ...      | ...     | 18      | 12,744   | 139           | 8,458  | 1,298    | 4,118       |  |   | 4,118  |   |
|            |              | 1937-38 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | 475           | 24,397 | 1,199    | 793         |  |   | 793  |   |
|            |              | 1948-49 | 2,628          | 22,550         | 25,178    | ...            | ...               | ...      | ...     | ...     | ...      | 500           | 26,353 | 1,518    | 861         |  |   | 861  |   |
|            |              | 1949-50 | 3,961          | 14,673         | 18,634    | ...            | ...               | ...      | ...     | ...     | ...      | 433           | 30,664 | 3,141    | 2,811       |  |   | 2,811  |   |
| 19.        | Kasaragod    | 1937-38 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | 224           | 5,910  | ...      | ...         | Exports—Timber.  |   |  |   |
|            |              | 1938-39 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | 259           | 7,501  | ...      | ...         |  |   | ...  |   |
|            |              | 1948-49 | 2,006          | 1,835          | 3,831     | ...            | ...               | ...      | ...     | ...     | ...      | 183           | 6,025  | ...      | ...         |  |   | ...  |   |
|            |              | 1949-50 | 2,600          | 1,520          | 4,420     | ...            | ...               | ...      | ...     | ...     | ...      | 202           | 6,583  | 1,076    | 842         |  |   | 842  |   |
|            |              | 1937-38 | 367            | 623            | 990       | ...            | ...               | ...      | ...     | ...     | ...      | 78            | 1,627  | 50       | ...         |  |   | ...  |   |
| 20.        | Muthi        | 1938-39 | 287            | 473            | 760       | ...            | ...               | ...      | ...     | ...     | ...      | 41            | 1,037  | 47       | 1,497       | Imports—Salt and tiles.<br>Exports—Fish and fish<br>products.                                  | Insignificant Port.                     |  |   |
|            |              | 1948-49 | 300            | 252            | 552       | ...            | ...               | ...      | ...     | ...     | ...      | 32            | 964    | 91       | 1,497       |  |   | 1,497  |   |
|            |              | 1949-50 | 185            | 170            | 355       | ...            | ...               | ...      | ...     | ...     | ...      | 25            | 698    | 70       | 1,468       |  |   | 1,468  |   |
|            |              | 1937-38 | Not available. | Not available. | ...       | 7,782          | 7,355             | ...      | ...     | ...     | ...      | 142           | 95,281 | 2,293    | 1,500       |  |   | 1,500  |   |
|            |              | 1938-39 | 6,841          | 7,213          | 14,054    | 6,987          | 7,111             | ...      | ...     | ...     | ...      | 142           | 95,691 | 2,666    | 1,470       |  |   | 1,470  |   |
| 21.        | Manga        | 1948-49 | 7,933          | 6,386          | 14,309    | 6,983          | 7,022             | ...      | ...     | ...     | ...      | 66            | 26,667 | 376      | 14,930      | 6,564  | 4,486                                   | Imports—Salt, Genl., Kero-<br>sene oil.<br>Exports—Fish and fish-<br>manure, tiles, timber, etc. | This Port has been con-<br>sidered suitable for the<br>construction of a major<br>Port. |
|            |              | 1949-50 | Not available. | Not available. | ...       | 4,063          | 5,802             | ...      | ...     | ...     | ...      | 72            | 86,982 | 366      | 15,337      | 5,810  | 4,652                                   |  |   |
|            |              | 1937-38 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | ...           | ...    | ...      | ...         | ...  | ...                                     |  |   |
|            |              | 1938-39 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | ...           | ...    | ...      | ...         | ...  | ...                                     |  |   |
|            |              | 1948-49 | Not available. | Not available. | ...       | ...            | ...               | ...      | ...     | ...     | ...      | ...           | ...    | ...      | ...         | ...  | ...                                     |  |   |

APPENDIX IV—*contd.*

## Madras Minor Ports—Part II.—Ports of less importance.

| Serial No.      | Name of Port | Years   | Traffic        |           |        | Passengers     |                   | Shipping |         |         |         | Country Craft |        | Finance        |              | Type of cargo  | General Remarks   |
|-----------------|--------------|---------|----------------|-----------|--------|----------------|-------------------|----------|---------|---------|---------|---------------|--------|----------------|--------------|--|---|
|                 |              |         | Imports        | Exports   | Total  | Em-<br>barking | Disem-<br>barking | Foreign  |         | Coastal |         | No.           | Tons   | Receipts       | Expenditures |  |   |
|                 |              |         |                |           |        |                |                   | No.      | Tonnage | No.     | Tonnage |               |        |                |              |  |   |
| 22. Hingurkatta |              | 1937-38 | (Tons)         | (Tons)    | (Tons) | 20             | ..                | ..       | ..      | ..      | ..      | 261           | 19,179 | Rs. 889        | Rs. 558      | Imports—Salt.<br>Exports—Tiles, Timber, Fire-wood.                                       | One of the chief sources of supply of firewood for the factories, at Mangalore. |
|                 |              | 1938-39 |                |           | ..     | ..             | ..                | ..       | ..      | ..      | ..      | 343           | 13,720 | 1,374          | 719          |  |   |
|                 |              | 1948-49 | T. 1,177       | 7,476     | 8,653  | ..             | ..                | ..       | ..      | ..      | ..      | 237           | 12,584 | 2,211          | 2,074        |  |   |
|                 |              | 1949-50 | 1,957          | 7,593     | 9,460  | ..             | ..                | ..       | ..      | ..      | ..      | 235           | 11,270 | 2,480          | 1,329        |  |   |
|                 |              | 1937-38 | Rs. 16,43,159  | 14,79,640 | ..     | 745            | 527               | ..       | ..      | 99      | 67,667  | 1094          | 33,474 | Not available. |              |  |   |
| 23. Comandapur  |              | 1938-39 | 15,83,186      | 13,34,377 | ..     | 797            | 695               | ..       | ..      | 126     | 84,322  | 919           | 32,635 | ..             | ..           | Imports—Salt, Copra-grain, pulses, sugar.<br>Exports—Tiles, Firewood, Timber, fish, cut. | One of the chief sources of supply of firewood for the factories, at Mangalore. |
|                 |              | 1948-49 | T. 6,973       | 35,939    | 32,932 | 8              | 23                | ..       | ..      | 15      | 8,083   | 935           | 38,784 | 5,765          | 2,360        |  |   |
|                 |              | 1949-50 | 2,202          | 31,616    | 33,819 | 7              | ..                | ..       | ..      | 21      | 14,828  | 1022          | 44,638 | 6,160          | 2,462        |  |   |
|                 |              | 1937-38 | Not available. |           |        | 99             | 5                 | ..       | ..      | ..      | ..      | 199           | 5,662  | 323            | 320          |  |   |
|                 |              | 1938-39 |                |           |        | ..             | 15                | ..       | ..      | ..      | ..      | 315           | 9,477  | 426            | 793          |  |   |
| 24. Bandipur    |              | 1948-49 | 609            | 4,536     | 5,166  | ..             | ..                | ..       | ..      | ..      | ..      | 200           | 9,122  | 713            | 1,383        | Imports—Salt and Tiles.<br>Exports—Firewood, fish, timber.                               |   |
|                 |              | 1949-50 | ..             | ..        | ..     | ..             | ..                | ..       | ..      | ..      | ..      | ..            | ..     | 660            | 1,451        |  |   |

**APPENDIX V**  
**Important Minor Ports in Madras State**  
**Harbour and Port Data**

| Sr. No. | Name of Port        | Description of the harbour  | Dredgers  | Port facilities available   |   |  |   |  | Remarks  |
|---------|---------------------|---|---|---|---|--|---|--|--|
|         |                     |   |   | Cranes  | Tugs and launches                             | Lighters and Barges                              | Workshop and Dry Dock   | Storage accommodation  |  |
| 1       | Kattinada           | Well protected Roadstead in Kattinada Bay, the anchorage being 6 miles off shore. Jetties alongside Kattinada Canal where loading and unloading is done. Dredging necessary over a bar with 4 ft. water at low tide.  | 1 Suction dredger "Ah-ham Godevaru" and 1 Bucket dredger "Coromandel"<br>1 Grab dredger "Kattinada"<br>3 Hopper barges. | 1 Steam crane travelling 2 Hand cranes.   | 1 Tug and 2 Launches.                         | 49 private owned Lighters 40 to 50 ton capacity. | 1 new dry Dock. 1 small Workshop  | Ample private-owned godowns.   | The Godavari Spit offers protection in the south-west monsoon.   |
| 2       | Masulipatnam        | Open Roadstead 5 miles off coast. Wharves at head of a very tortuous creek.   | NIL.  | 1—3 ton hand crane fixed on wharf.  | 1 small Launch 12 H.P.                        | 20 Private-owned Lighters.                       | NIL.  | Private-owned godowns of 25,000 tons total capacity available.   | Subject to periodical cyclones.  |
| 3       | Cuddalore           | Open Roadstead anchorage being 3 miles off shore. Wharves of a total length of 2,539 ft. in the back water connecting to sea. Bars usually form at the mouth, but boats can negotiate at high tides.  | Section Dredger "Bismarck" and 1 Pipeline.  | 3 one-ton hand cranes   | NIL.  | Private-owned boats and Lighters.                | No Workshop, but one Dry Dock about 110' X 30' for docking the Dredger. | Private-owned godowns of 30,000 tons total capacity available.   | Port can work all the year round except actual wet weather days. Important centre for coal distribution.   |
| 4       | Nagapattinam.       | Open Roadstead 1½ miles off shore. Wharves at head of a creek. Lighters have to cross Bar 14 to 34 ft. LWOST.   | 1 Grab dredger, 2 Silt barges, 1 water boat.  | 2-3 ton hand cranes   | 1 Inspection Launch                           | Do.  | NIL.  | 3 Transit Sheds, 1 Passenger Shed owned by Port. Ample private godowns.  | Important passenger port. Even coastal sailing vessels have to anchor outside.   |
| 5       | Kozhikode (Calicut) | Two Piers 775 ft. each, jutting out into the sea with trolley lines, cranes, etc. Port is closed during monsoon.  | NIL   | North Pier—5 one-ton hand cranes, 2 five-ton hand cranes, 1 crane.<br>South Pier 5 one-ton hand cranes, 1 five-ton hand crane, 1 three-ton steam crane. | 1 Motor Launch.                               | About 200 private-owned Lighters and boats.      | NIL.  | 2 platforms and one open shed at North Pier. 4 Platforms and 4 sheds at South pier.                            | A train line connects piers with sheds. About 40 open trolley trucks are employed, which is a wharf of Kozhikode offers scope for all weather medium sized port.   |
| 6       | Mangalore           | This port is situated at the confluence of the rivers NETRAVATTI and GOURPUR. Ships lie in the open Roadstead just over one mile off shore. Port is closed during monsoon. 3000 ft. of wharves and several private piers with 5 to 6 ft. of water along side. | Suction dredger "Gurupur" and 1 pipeline. One Grab dredger 5 silt punts.  | 1 five-ton, 1 two-ton, 1 one-ton hand crane fixed on wharves.   | 1 tug, 1 motor Launch, 1 Outboard motor boat. | About 40 private-owned Lighters.                 | One small Workshop and one dry Dock 110' X 30'.                         | Two Transit sheds 6,400 S. Ft. 1 passenger shed. 2 Customs godowns. Several private-owned godowns and jetties. | Deficient in road and railway communications.  |
| 7       | Tuticorin           | A protected all-weather port in the Gulf of Mannar. Anchorage 5 miles off shore. Channel needs constant dredging. 3 piers of 315, 478' and 138' and two cross wharves 288 and 388'. The first two piers are situated in trolley line. 44 trolleys available.  | One hopper bucket dredger "Tuticorin".  | 1 five-ton portable 1 three-ton portable 1 two-and-half tons fixed. 3 one-and-half tons 6 one-ton cranes.   | One motor launch one private-owned tug.       | Ample private-owned lighters.                    | No workshop. An old Dry Dock now in disuse. Can be repaired & used.     | Ample open space for coal stowing. 6 sheds owned by Port. Can accommodate 93,000 bags.                         | Construction of boats and lighters is a specialty of this place. Important fisheries centre—only port with a large export of live stock (goats). Highest tonnage handled in 1935-36—6,40,000. This is the only minor port in India which has been constituted into a Port Trust. |



## APPENDIX VI

## Minor Ports in Travancore-Cochin State

| Serial No.             | Name of Port | Year     | TRADE                     |                |         |          |          |  | SHIPPING   |                 |   |                 |   |  | FINANCE  |  | Rates and charges | Type of cargo imported or exported | Description of Port | Port facilities available |
|------------------------|--------------|----------|---------------------------|----------------|---------|----------|----------|--|--|-----------------|---|-----------------|---|--|--|--|-------------------|------------------------------------|---------------------|---------------------------|
|                        |              |          | Imports (Value in rupees) | Exports (Tonn) | FOREIGN |          | COASTING |  | COUNTRY CRAFT  |                 | Receipts Rs.  | Expenditure Rs. |   |  |  |  |                   |                                    |                     |                           |
|                        |              |          |                           |                | No.     | Tonnage  | No.      | Tonnage  | No.  | Tonnage         |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1                      | Alleppey     | 1936-37  | ...                       | ...            | 74      | 2,55,106 | 274      | 5,64,72  | 77   | 6,983           | 23,364  | 27,371          | Port dues Rs. 0-0-9 per ton payable once only for any Travancore port in 30 days. Landing and shipping dues as per Schedule for Alleppey. | Imports:— Building and Eng. materials, chemicals, Dyecolors, Tanning substances, machinery, Salt, Teas, Foodgrains. Exports:—Coir & Coir products, Jute, Sand, oil, Spices Firewood. | Open roadstead. Mud bank off coast renders the sea smooth for shipping operations. | There is one pier 68½ long x 22' with two steam cranes, 2-ton capacity each, two hand cranes of which one is 5-ton capacity and 1 of 2-ton capacity. 22 cargo lighters (4 departmental and 18 private-owned) of 40 to 50 ton capacity are available. 13 closed godowns and 5 open godowns provide ample storage space. 2 Vessels are available for freight and miscellaneous purposes. |                   |                                    |                     |                           |
|                        |              | 1937-38  | ...                       | ...            | 79      | 2,89,380 | 278      | 5,95,29  | 85   | 7,556           | 25,315  | 31,014          |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 1938-39  | ...                       | ...            | 79      | 2,93,005 | 289      | 6,62,48  | 29   | 2,474           | 27,058  | 32,358          |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 1947-48  | 1,63,02,299               | 92,589         | 39      | 1,58,300 | 74       | 1,34,70  | 75   | 4,812           | 15,659  | 35,659          |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 1948-49  | 1,80,90,076               | 71,339         | 60      | 2,38,574 | 82       | 2,08,79  | 32   | 2,433           | 21,630  | 46,641          |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 1949-50  | 38,86,038                 | 82,031         | 72      | 2,81,896 | 137      | 2,24,99  | 27   | 1,712           | 18,023  | 26,368          |   |  |  |  |                   |                                    |                     |                           |
|                        |              | STEAMERS |                           |                |         |          |          |  |  |                 |   |                 |   | COUNTRY CRAFT  |  |  |                   |                                    |                     |                           |
|                        |              | No.      | Tonnage                   | No.            | Tonnage | No.      | Tonnage  |  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 57       | 1,85,329                  | 56             | 5,718   | 2,691    | 424      | Port dues at Rs. 0-0-9 per ton. No Landing & Shipping charges. | Imports:— Raw cashewnuts, cotton. Exports:— Processed cashewnuts in cases, oil, coconut. | Open roadstead. | There is one tug. Floating landing stage and barges all private-owned. Private owned godowns are available. |                 |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 55       | 1,76,655                  | 46             | 5,333   | 3,154    | 362      |  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
|                        |              | 77       | 2,32,780                  | 97             | 9,080   | 3,330    | 495      |  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| Figures not available. |              |          |                           |                |         |          |          |  |  |                 |   | ...             | ...   | 1,168  | 944  |  |                   |                                    |                     |                           |
| 1948-49                | ...          | ...      | 12                        | 46,154         | 14      | 1,571    | 1,524    | 1,404  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1949-50                | ...          | ...      | 18                        | 59,893         | 12      | 1,357    | 1,071    | 639  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1937-38                | ...          | ...      | 115                       | 3,69,048       | 17      | 1,453    | 12,235   | 265  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1938-39                | ...          | ...      | 107                       | 3,34,781       | 18      | 1,749    | 12,133   | 364  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1948-49                | ...          | ...      | 4                         | 5,309          | 3       | 344      | 688      | 1,120  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1949-50                | ...          | ...      | 3                         | 1,282          | 12      | 973      | 417      | 533  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1937-38                | ...          | ...      | 54                        | 1,81,428       | 1       | 62       | 7,335    | 533  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1938-39                | ...          | ...      | 45                        | 1,46,425       | 1       | 54       | 6,015    | 549  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1948-49                | ...          | ...      | ...                       | ...            | ...     | ...      | ...      | 1,576  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 1949-50                | ...          | ...      | ...                       | ...            | 3       | 199      | 61       | 917  |  |                 |   |                 |   |  |  |  |                   |                                    |                     |                           |
| 4                      | Colachel     |          |                           |                |         |          |          |  |  |                 |   |                 | Exports—Sands and Pulmyna fibre.  | Do.  |  |  |                   |                                    |                     |                           |

### Minor Ports in Travancore-Cochin State

| Sl. No. | Name of Port   | Year    | TRADE                        |                   | SHIPPING |         |          |          |               |         | FINANCE   |             | Rates and charges  | Type of cargo imported or exported | Description of Port                         | Port facilities available |
|---------|----------------|---------|------------------------------|-------------------|----------|---------|----------|----------|---------------|---------|-----------|-------------|--|------------------------------------|---|---------------------------|
|         |                |         | Imports<br>(Value in rupees) | Exports<br>(Tons) | FOREIGN  |         | STEAMERS |          | COUNTRY CRAFT |         | Receipts  | Expenditure |  |                                    |   |                           |
|         |                |         |                              |                   | No.      | Tonnage | No.      | Tonnage  | No.           | Tonnage |           |             |  |                                    |   |                           |
| 5       | Kolthoam       | 1937-38 | ...                          | ...               |          |         | 20       | 68,267   | ...           | ...     | Rs. 2,723 | Rs. ...     | Port dues at Rs. 0-0-9 per ton. No landing & shipping charges. | Export of masts.                   | Open roadstead.                             |                           |
|         |                | 1938-39 | ...                          | ...               |          |         | 23       | 73,338   | ...           | ...     | 2,621     | ...         |  |                                    |   |                           |
|         |                | 1948-49 | ...                          | ...               |          |         | 41       | 1,80,674 | 90            | 8,360   | 7,594     | ...         |  |                                    |   |                           |
|         |                | 1949-50 | ...                          | ...               |          |         | 38       | 1,36,753 | 46            | 6,172   | 5,823     | ...         |  |                                    |   |                           |
|         |                | 1937-38 | ...                          | ...               |          |         | ...      | ...      | 60            | 6,954   | 51        | ...         |  |                                    |   |                           |
| 6       | Mumambhoom     | 1938-39 | ...                          | ...               |          |         | ...      | ...      | 7             | 722     | 13        | ...         | Do.  |                                    | Open for landing and shipping of salt only. |                           |
|         |                | 1948-49 | ...                          | ...               |          |         | ...      | ...      | 72            | 3,780   | 7         | ...         |  |                                    |   |                           |
|         |                | 1949-50 | ...                          | ...               |          |         | ...      | ...      | ...           | ...     | ...       | ...         |  |                                    |   |                           |
|         |                | 1937-38 | ...                          | ...               |          |         | ...      | ...      | 32            | 3,259   | 131       | ...         |  |                                    |   |                           |
|         |                | 1938-39 | ...                          | ...               |          |         | ...      | ...      | 29            | 2,784   | 117       | ...         |  |                                    |   |                           |
| 7       | Manakudy       | 1948-49 | ...                          | ...               |          |         | ...      | ...      | 154           | 10,372  | 517       | ...         | Do.  |                                    |   |                           |
|         |                | 1949-50 | ...                          | ...               |          |         | ...      | ...      | 40            | 3,225   | 153       | ...         |  |                                    |   |                           |
| 8       | Kovalam        |         |                              |                   |          |         |          |          |               |         |           |             |  |                                    |   |                           |
| 9       | Rajakamangalam |         |                              |                   |          |         |          |          |               |         |           |             |  |                                    |   |                           |

These ports have become defunct and no figures are available.

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APPENDIX VII  
BOMBAY MUMBAI PORTS  
Trade Statistics

| Sl. No.               | Name of Port | Highest known trade in any one year between 1928-29 to 1938-39 | 1948-49       |               |               | 1949-50       |               |               | Country craft |         |         |          | Type of cargo                              |                                      | Passenger Traffic in 1949-50 |  |
|-----------------------|--------------|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------|---------|----------|--|--------------------------------------|------------------------------|--|
|                       |              |  | Imports       | Exports       | Total         | Imports       | Exports       | Total         | 1948-49       |         | 1949-50 |          | Imports                                    | Exports                              |                              |  |
|                       |              |  |               |               |               |               |               |               | No.           | Tonnage | No.     | Tonnage  |  |                                      |                              |  |
| Port North of Bombay. |              |  |               |               |               |               |               |               |               |         |         |          |  |                                      |                              |  |
| 1                     | Gadga        | (Value in Rupees)  | 24,744        | 23,970        | 48,614        | 13,045        | 8,095         | 21,140        | 1,327         | 24,744  | 961     | 13,045   | Kerosene oil, cotton seed.                 | Onions, sand, clay, pulses, chilies. |                              |  |
| 2                     | Dholera      | 3,90,000 in 1938-39  | 2,088         | 602           | 2,690         | 1,672         | 96            | 1,768         | 128           | ...     | 156     | ...      | Bamboos, coconuts, cotton seed.            | Mustard, sesame, ghery chilies.      |                              |  |
| 3                     | Camby        |  | 9,588         | 9,683         | 19,271        | 4,598         | 6,000         | 10,598        | 628           | 13,188  | 624     | 12,480   | Timber, tiles.                             | Tobacco, wheat.                      |                              |  |
| 4                     | Kari         |  | 2,431         | 928           | 3,359         | 1,546         | 963           | 2,509         | 219           | 3,099   | 228     | 2,431    | Groundnut, oil, Cat, chilies.              | Cotton, timber, earthenware.         |                              |  |
| 5                     | Dahanu       |  | 1,996         | 1,997         | 3,993         | 3,535         | 3,534         | 7,069         | 147           | 1,996   | 238     | 3,536    | Animals, timber, tiles, building material. | Animals & passengers.                |                              |  |
| 6                     | Breach       | 1,51,48,000 in 1932-33.  | 35,648        | 35,320        | 68,956        | 33,423        | 30,815        | 64,238        | 1,564         | 39,400  | 1,258   | 34,450   | Coccolam, tiles, timber, oil, stones.      | Cotton, pulses, bamboos.             |                              |  |
| 7                     | Sant         | 1,21,45,000 in 1933-34.  | 4,054         | 7,440         | 11,494        | 3,814         | 2,294         | 6,108         | 713           | 12,262  | 646     | 13,900   | Ghery carbons, coconuts, tiles.            | Cotton, bamboos, teak.               |                              |  |
| 8                     | Martand      | ...  | Rs. 2,000     | Rs. 44,000    | Rs. 46,000    | Rs. 16,456    | Rs. 45,995    | Rs. 62,451    | 299           | 10,124  | 155     | 4,285    | Tiles & bricks                             | Dry fish.                            |                              |  |
| 9                     | Buldar       | 19,67,000 in 1936-37   | Rs. 1,77,214  | Rs. 4,40,000  | Rs. 6,17,214  | Rs. 1,97,328  | Rs. 5,46,750  | Rs. 7,44,078  | 861           | 12,995  | 885     | 13,220   | Mangalore tiles                            | Timber.                              |                              |  |
| 10                    | Billimora    | 14,51,603 in 1938-39   | Rs. 21,10,793 | Rs. 32,96,959 | Rs. 54,07,722 | Rs. 21,79,436 | Rs. 27,53,958 | Rs. 49,33,394 | ...           | ...     | ...     | ...      | Tiles, onions, oil, fish                   | Oil cake, pulses, oil.               |                              |  |
| 11                    | Narasari     | ...  | 1,694         | 912           | 2,606         | 1,681         | 75            | 1,756         | 214           | 4,850   | 176     | 3,912    | Onions, tiles                              | Cotton, building materials.          |                              |  |
| 12                    | Umarsadi     | ...  | 900           | 1,600         | 2,500         | 950           | 1,890         | 2,840         | 350           | 1,700   | 450     | 2,200    | Dryfish, onions, tiles.                    | Oil cake & timber.                   |                              |  |
| 13                    | Kolab        | ...  | Rs. 2,37,444  | Rs. 74,573    | Rs. 3,12,018  | Rs. 2,07,703  | Rs. 33,227    | Rs. 2,40,930  | 141           | 3,874   | 141     | 3,307    | Tiles, fish, cement, oils, etc.            | Teak, coal, fish, cotton etc.        |                              |  |
| 14                    | Uradgason    | ...  | 215           | 7,225         | 7,440         | 222           | 6,298         | 6,520         | 680           | 22,593  | 395     | 12,052   | Onions, fish, timber                       | Timber.                              |                              |  |
| 15                    | Dahanu       | ...  | 806           | 21,411        | 22,217        | 1,142         | 14,167        | 15,309        | 844           | 31,633  | 658     | 23,767   | ...  | Timber.                              |                              |  |
| 16                    | Kelwa        | ...  | 605           | 1,408         | 2,013         | 532           | 1,414         | 1,946         | 231           | 3,007   | 224     | 2,811    | Coke & coal ash                            | Channan.                             |                              |  |
| 17                    | Arnalla      | ...  | Rs. 95,528    | Rs. 42,928    | Rs. 1,38,456  | Rs. 1,85,799  | Rs. 15,926    | Rs. 2,01,725  | 2,937         | 64,729  | 5,382   | 1,13,398 | Stones, tiles, seeds                       | Timber, coal, fish.                  |                              |  |
| 18                    | Bassein      | ...  | 1,894         | 556           | 2,450         | 569           | 1,796         | 2,365         | 732           | 6,765   | 584     | 6,621    | Tiles, cucumbers                           | Teak, fish.                          |                              |  |
| 19                    | Venwa        | ...  | 7,844         | 2,325         | 10,169        | 1,560         | 1,796         | 3,356         | 1,374         | 27,480  | 2,336   | 52,436   | Fish, timber, sand, time                   | Fish, ghery.                         |                              |  |
| 20                    | Treasury     | ...  | 2,232         | 13,997        | 15,229        | 5,510         | 14,419        | 19,929        | 576           | 18,607  | 670     | 23,443   | Bricks, firewood, timber etc.              | Paddy, bricks.                       |                              |  |

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**APPENDIX VII—contd.**  
**BOMBAY MINOR PORTS**

| Sr. No. | Name of Port                | Highest known trade in any pre-war year between 1928-29 to 1934-35 | 1948-49       |            |               | 1949-50       |              |               | Country Craft |         |         |                        | Type of Cargo                    |                                    | Passenger Traffic in 1949-50 |  |
|---------|-----------------------------|--|---------------|------------|---------------|---------------|--------------|---------------|---------------|---------|---------|------------------------|----------------------------------|------------------------------------|------------------------------|--|
|         |                             |  | Imports       | Exports    | Total         | Imports       | Exports      | Total         | 1948-49       |         | 1949-50 |                        | Imports                          | Exports                            |                              |  |
|         |                             |  |               |            |               |               |              |               | Number        | Tonnage | Number  | Tonnage                |                                  |                                    |                              |  |
|         | Port North of Bombay—contd. | (Value in Rupees)  | (Tons)        | (Tons)     | (Tons)        | (Tons)        | (Tons)       | (Tons)        |               |         |         |                        |                                  |                                    |                              |  |
| 21      | Thana                       | ...  | ...           | ...        | 98,415        | 400           | 98,515       | 1,074         | ...           | 750     | 6,716   | Salt, tiles, teak etc. | Clay, firewood, timber.          |                                    |                              |  |
| 22      | Kajura                      | ...  | 4,204         | 69,367     | 73,571        | 3,649         | 55,978       | 59,627        | 3,225         | 62,024  | 3,552   | 69,942                 | Tiles, timber, fish.             | Bricks & sand.                     |                              |  |
|         | Port South of Bombay.       |  |               |            |               |               |              |               |               |         |         |                        |                                  |                                    |                              |  |
| 23      | Panvel                      | ...  | 800           | 10,002     | 10,802        | 600           | 9,780        | 10,380        | 653           | 6,900   | 697     | 6,885                  | Kerosene Oil, cement             | Rice, bricks.                      | 3,22,514 (Mahawa Sub-Port).  |  |
| 24      | Moka                        | ...  | 3,192         | 87,910     | 91,102        | 3,276         | 86,970       | 90,246        | 1,936         | 52,699  | 1,811   | 49,965                 | Cement, firewood                 | Salt                               | 4,61,870 (Rayas sub-ports).  |  |
| 25      | Karanja                     | ...  | 2,617         | 10,385     | 13,002        | 1,882         | 20,617       | 22,499        | 1,115         | 12,603  | 961     | 10,316                 | Kerosene oil, petrol, sugar.     | Salt                               |                              |  |
| 26      | Alibag                      | ...  | 2,589         | 2,589      | 5,178         | 3,171         | 3,171        | 6,342         | 347           | 2,589   | 360     | 3,171                  | Oil, cotton, glue                | Fish, timber etc.                  |                              |  |
| 27      | Mandwa                      | 1,75,000 in 1928-39  | 5,51,000      | 7,59,305   | 13,10,305     | 5,93,300      | 8,07,400     | 13,99,700     | 206           | ...     | 244     | ...                    | General cargo                    | Firewood grass etc.                | 8,546                        |  |
| 28      | Marmal (Jamini)             | ...  | 9,475         | 11,203     | 20,678        | 9,408         | 10,093       | 19,501        | 171           | 1,868   | 1,193   | 1,517                  | Tea, salt, spices, tobacco       | Firewood, betelnuts, myrobalsams.  | 36,418                       |  |
| 29      | Shivwardhan                 | ...  | 3,71,039      | 98,000     | 4,69,039      | 4,40,103      | 3,10,140     | 7,50,243      | 201           | 3,393   | 243     | 4,957                  | Nuts, oils, pulses etc.          | Wood, myrobalsams                  | 42,270                       |  |
| 30      | Revadanda                   | 40,05,000 in 1929-30   | 2,700         | 35,890     | 38,590        | 2,350         | 34,700       | 37,050        | 1,410         | 22,230  | 1,100   | 17,580                 | Kerosene oil, pulses, tiles etc. | Rice, paddy, dryfish.              |                              |  |
| 31      | Banet                       | 40,88,000 in 1929-30   | 13,336        | 1,835      | 15,171        | 5,323         | 1,784        | 7,107         | 678           | 13,859  | 616     | 12,440                 | Tiles, salt, cement              | Firewood, myrobalsams.             |                              |  |
| 32      | Dabhol                      | 39,73,000 in 1926-27   | 20,000        | 2,000      | 22,000        | 25,000        | 2,200        | 27,200        | 898           | 20,000  | 1,069   | 27,000                 | Tiles, salt, foodgrains          | Myrobalsams wood                   | 1,27,787                     |  |
| 33      | Jajpur                      | 12,08,000 in 1933-34   | Rs. 28,11,594 | Rs. 27,334 | Rs. 31,84,924 | Rs. 36,52,076 | Rs. 2,08,665 | Rs. 38,60,741 | ...           | ...     | ...     | ...                    | Foodgrains, fish.                | Timber, myrobalsams                | 53,018                       |  |
| 34      | Varanda                     | ...  | Rs. 1,097     | Rs. 586    | Rs. 1,683     | Rs. 1,355     | Rs. 217      | Rs. 1,572     | 200           | 2,450   | 163     | 1,956                  | Tiles, foodgrains                | Mangoes, firewood                  | 8,721                        |  |
| 35      | Ramgiri                     | 62,24,000 in 1926-27   | ...           | ...        | ...           | ...           | ...          | ...           | 847           | 37,848  | 800     | 35,613                 | Foodgrains, salt, genl. cargo.   | Soapnuts, mangoes, pulses, cotton. | 1,20,354                     |  |
| 36      | Purand                      | ...  | 6,675         | 1,177      | 7,852         | 3,208         | 875          | 4,083         | 169           | 3,698   | 161     | 4,047                  | Foodgrains, salt, genl. cargo.   | Bamboo, firewood                   | 4,704                        |  |
| 37      | Jalapur                     | 31,06,000 in 1929-30   | 4,380         | 850        | 5,230         | 5,400         | 830          | 6,230         | 334           | 11,450  | 62      | 1,503                  | Foodgrains, tiles, genl. cargo.  | Bamboo, hemp, mangoes              | 54,987                       |  |
| 38      | Vilaydurg                   | ...  | 10,000        | 3,700      | 13,700        | 4,000         | 3,100        | 7,100         | 575           | 17,000  | 503     | 13,100                 | ...                              | Mango                              | 50,735                       |  |
| 39      | Dergad                      | 13,20,000 in 1928-29   | 3,479         | 2,690      | 6,169         | 5,709         | 3,415        | 9,124         | 689           | 3,337   | 962     | 2,998                  | Foodgrains, kerosene oil.        | Mangoes, sugarcane                 | 33,925                       |  |
| 40      | Mahwa                       | 49,80,000 in 1929-30   | 13,436        | 5,596      | 19,032        | 18,306        | 5,763        | 24,069        | 665           | 16,475  | 364     | 11,817                 | Foodgrains, cloth, pulses        | Fish, gunnies, bamboos.            | 67,932                       |  |
| 41      | Vengurda                    | 52,13,000 in 1928-29   | 32,070        | 8,137      | 40,207        | 3,663         | 8,491        | 12,154        | 444           | 15,925  | 266     | 9,800                  | Foodgrains, tiles                | Coconut oil, etc.                  | 36,786                       |  |
| 42      | Kimpad                      | ...  | 5,016         | 4,082      | 9,098         | 5,293         | 4,319        | 9,612         | 90            | 3,150   | 102     | 3,750                  | Tiles, mangoes, cinnamon.        | Coconuts, nuts, wood, bamboo.      |                              |  |

APPENDIX VII—*contd.*

## BOMBAY MINOR PORTS

| Sl. No.                      | Name of Port | Highest known trade in any pre-war year between 1928-29 to 1938-39 | 1948-49 |         |        | 1949-50 |         |        | Country Craft |         |         |         | Type of Cargo                            |                         | Passenger Traffic in 1949-50 |  |
|------------------------------|--------------|--|---------|---------|--------|---------|---------|--------|---------------|---------|---------|---------|--|-------------------------|------------------------------|--|
|                              |              |  | Imports | Exports | Total  | Imports | Exports | Total  | 1948-49       |         | 1949-50 |         | Imports                                  | Exports                 |                              |  |
|                              |              |  |         |         |        |         |         |        | Number        | Tonnage | Number  | Tonnage |  |                         |                              |  |
| Ports South of Bombay—contd. |              |  |         |         |        |         |         |        |               |         |         |         |  |                         |                              |  |
| 43                           | Sadanvgrad . | ...  | 1,938   | 7,660   | 9,598  | 3,768   | 7,431   | 11,249 | 63            | 20,890  | 621     | 21,735  | Misc. cargo, tiles, etc.                 | Timber, firewood.       |                              |  |
| 44                           | Karnar .     | 21,94,000 in 1929-30   | 7,311   | 3,834   | 11,145 | 6,431   | 1,604   | 8,035  | 600           | 5,000   | 600     | 5,000   | Tiles, oils, foodgrains                  | Salted fish, nuts, etc. | 3,291                        |  |
| 45                           | Bilckri .    | ...  | 725     | 6,765   | 7,490  | 661     | 9,125   | 9,786  | 199           | 14,174  | 275     | 15,675  | Tiles, salt-fish .                       | Timber, foodgrains.     |                              |  |
| 46                           | Tadri .      | 25,59,000 in 1928-33   | 15,600  | 16,115  | 31,715 | 14,624  | 9,558   | 24,182 | 624           | 1,262   | 647     | 11,351  | Tiles, oils . . .                        | Timber, salt, nuts      | 315                          |  |
| 47                           | Kumta .      | ...  | 3,246   | 2,075   | 5,321  | 4,869   | 2,612   | 7,481  | 114           | 2,517   | 192     | 4,112   | Foodstuffs, oils . .                     | Nuts, pulses and fish . | 1,413                        |  |
| 48                           | Harwar .     | 62,89,000 in 1928-29   | 50,998  | 2,843   | 53,841 | 43,005  | 1,953   | 44,958 | 446           | 11,766  | 451     | 15,938  | Grain, pulses & tiles .                  | Timber, bamboos.        |                              |  |
| 49                           | Bhatkal .    | 6,75,000 in 1928-29  | 4,476   | 540     | 5,016  | 3,599   | 778     | 4,377  | 160           | 5,385   | 131     | 4,767   | Foodgrains, pulses, tiles                | Wood, fish . .          | 1,075                        |  |
| 50                           | Nangan .     | ...  | 2,015   | 9,337   | 11,352 | 1,602   | 7,545   | 9,147  | 140           | 1,868   | 193     | 16,302  | Salt, oils . . .                         | Timber, cocoanuts.      |                              |  |
| 51                           | Rajpuri .    | ...  | 9,450   | 10,593  | 19,953 | 7,504   | 15,950  | 23,454 | 140           | 1,868   | 193     | 16,302  | Foodgrains, tea, salt, tobacco.          | Firewood, betelnut      |                              |  |
| 52                           | Harwar .     | ...  | 2,185   | 834     | 3,019  | 2,491   | 944     | 3,435  | 230           | 4,861   | 275     | 6,999   | Onions, sugar, kerosene oil, foodgrains. | Myrobolam, betelnut.    |                              |  |

## APPENDIX VIII

## Port of Okla in Bombay State

| Year    | TRADE    |          |          | SHIPPING |          |         |          |               |         | FINANCES     |                   | Rates and charges  | Name of cargo imported or exported                            | Description of the harbour                                    | Dredges available | Port Facilities AVAILABLE   |  |  |                       | Remarks               |
|---------|----------|----------|----------|----------|----------|---------|----------|---------------|---------|--------------|-------------------|--|---|---|-------------------|---|--|--|-----------------------|-----------------------|
|         | Imports  | Exports  | Total    | Foreign  |          | Coastal |          | Country Craft |         | Receipts     | Expenditure       |  |   |   |                   |   |  |  |                       |                       |
|         |          |          |          | No.      | Tonnage  | No.     | Tonnage  | No.           | Tonnage |              |                   |  |   |   |                   |   |  |  |                       |                       |
|         |          |          |          |          |          |         |          |               |         |              |                   |  |   |   |                   |   |  |  |                       |                       |
| 1926-27 | 42,526   | 1,36,995 | 1,79,521 | 99       | 5,69,498 | 246     | 2,66,174 | 685           | 19,840  | Rs. 2,37,814 | Rs. 1,80,163      | Pier dues Rs. 0-1-6 per ton N. R. T. of ocean-going steamers, lower rates for coasting steamers. | On Books—Rs. 99,59,578 re- presented by asset. Rs. 63,54,732. | On Books—Rs. 99,59,578 re- presented by asset. Rs. 63,54,732. | Nil.              | 1 steam tug 385 H.P. 1 Trawl 2 motor launches. One diesel locomotive and 60 odd trucks (motor-gauges) of 240 capacity and one steam crane 4-ton capacity each. 10 barges of 10-ton capacity each. Trawl capacity 400 tons. One fixed steam crane of 8-ton capacity in yard. | 14 steel barges of 10-ton capacity each. 3 are used for delivery in 1931-32. | There is good wharves and a power barge. | Storage accommodation | Plough is compulsory. |
| 1927-28 | 1,07,712 | 1,24,476 | 2,32,188 | 100      | 3,06,858 | 232     | 2,65,376 | 743           | 24,233  | 2,74,965     | 2,23,377          |  |   |   |                   |   |  |  |                       |                       |
| 1928-29 | 65,546   | 1,09,656 | 1,75,102 | 119      | 6,51,630 | 226     | 2,58,404 | 712           | 21,426  | 2,44,844     | 2,07,064          |  |   |   |                   |   |  |  |                       |                       |
| 1929-30 | 1,65,941 | 2,18,697 | 3,84,638 | 91       | 4,82,462 | 69      | 53,181   | 1,242         | 54,087  | 4,27,967     | 794,070           |  |   |   |                   |   |  |  |                       |                       |
| 1930-31 | 2,73,188 | 1,94,655 | 4,67,843 | 104      | 5,33,224 | 28      | 19,332   | 813           | 28,539  | 6,46,389     | 1,12,418          |  |   |   |                   |   |  |  |                       |                       |
| 1931-32 | 2,37,163 | 2,22,643 | 4,59,807 | 72       | 3,38,668 | 54      | 42,620   | 752           | 27,830  | 8,36,486     | 8,81,932          |  |   |   |                   |   |  |  |                       |                       |
|         |          |          |          |          |          |         |          |               |         |              | 8 months figures. |  |   |   |                   |   |  |  |                       |                       |
|         |          |          |          |          |          |         |          |               |         |              | Rs. 9,34,745      | Rs. 8,20,163   |   |   |                   |   |  |  |                       |                       |
|         |          |          |          |          |          |         |          |               |         |              | 1932-31           |  |   |   |                   |   |  |  |                       |                       |



### Trade Statistics

The Bombay  
Steam Nav. Co  
has a regular  
passenger ser-  
vice to this  
port.



# APPENDIX XI Minor Ports in Kutch State

| No. | Name of Port | Year    | TRADE          |                |               | SHIPPING. |         |         |          |               |         | FINANCES |             | Port facilities available | Remarks  |   |
|-----|--------------|---------|----------------|----------------|---------------|-----------|---------|---------|----------|---------------|---------|----------|-------------|---------------------------|--|---|
|     |              |         | Imports (Tons) | Exports (Tons) | Total (Tons)  | Foreign   |         | Coastal |          | Country Craft |         | Receipts | Expenditure |                           |  |   |
|     |              |         |                |                |               | No.       | Tonnage | No.     | Tonnage  | No.           | Tonnage |          |             |                           |  | No.   |
| 1   | Mundra.      | 1937-38 | 9,866          | 1,061          | 10,927        | ...       | ...     | ...     | ...      | ...           | 232     | 8,349    | 606         | Rs.                       | A timber jetty in the Bocha creek.   | ...   |
|     |              | 1938-39 | 6,825          | 392            | 7,217         | ...       | ...     | ...     | ...      | ...           | 250     | 5,798    | 2,378       |                           |  |   |
|     |              | 1948-49 | 6,556          | 340            | 6,896         | ...       | ...     | ...     | ...      | ...           | 288     | 11,204   | 2,340       |                           |  |   |
|     |              | 1949-50 | 5,591          | 549            | 6,140         | ...       | ...     | ...     | ...      | ...           | 298     | 12,789   | 4,191       |                           |  |   |
|     | Mandvi       | 1937-38 | Rs. 74,39,984  | Rs. 2,64,356   | Rs. 77,04,340 | 23        | 87,478  | 212     | 4,22,062 | 1,538         | 44,715  | 11,157   |             |                           | 2 open sheds, 1 port go-down and 1 Customs Warehouse are available. Diarrhasias for convenience of passengers. A wharf affords convenient place for loading of goods from lighters and sailing craft—all lighters. | Open sea roadstead in the Gulf of Kutch. Mandvi is on the Bombay-Karachi passenger service line. There is a passenger service between OKHA and Mandvi also. Well-known place for boat and lighter and country craft building. |
|     |              | 1938-39 | 90,04,125      | 2,37,823       | 92,41,948     | 16        | 46,665  | 137     | 2,21,628 | 2,654         | 44,073  | 11,214   |             |                           |  |   |
|     |              | 1947-48 | 93,54,580      | 11,32,340      | 1,04,86,920   | 35        | 99,910  | 64      | 57,910   | 2,622         | 49,038  | 5,967    |             |                           |  |   |
|     |              | 1948-49 | 97,34,470      | 15,37,454      | 1,12,71,924   | 40        | 44,515  | 79      | 79,636   | 3,315         | 79,945  | 7,610    |             |                           |  |   |
|     |              | 1949-50 | 63,45,454      | 8,62,369       | 72,07,823     | 37        | 52,482  | 38      | 54,099   | 1,234         | 44,657  | 13,566   |             |                           |  |   |
|     | (Highest)    | 1946-47 | 171,47,498     | 14,13,837      | 1,85,61,335   | ...       | ...     | ...     | ...      | ...           | 226     | 4,908    | 3,205       |                           |  | This port is in the Godia creek with a high tidal range (15 ft.).   |
| 3   | Jakhau       | 1937-38 | 3,860          | 251            | 4,112         | ...       | ...     | ...     | ...      | ...           | 199     | 4,052    | 2,321       |                           |  |   |
|     |              | 1938-39 | 3,607          | 149            | 3,756         | ...       | ...     | ...     | ...      | ...           | 141     | 5,249    | 2,103       |                           |  |   |
|     |              | 1948-49 | 4,422          | 100            | 4,522         | ...       | ...     | ...     | ...      | ...           | 136     | 5,794    | 1,012       |                           |  |   |
|     |              | 1949-50 | 4,565          | 250            | 4,815         | ...       | ...     | ...     | ...      | ...           | ...     | ...      | 1,297       |                           |  |   |
| 4   | Koteswar     | 1937-38 | 496            | ...            | 496           | ...       | ...     | ...     | ...      | ...           | ...     | ...      | ...         |                           |  | This port is in the Khorit creek with a high tidal range (15 ft.).  |
|     |              | 1938-39 | ...            | ...            | ...           | ...       | ...     | ...     | ...      | ...           | ...     | ...      | ...         |                           |  |   |
|     |              | 1948-49 | 117            | 52             | 169           | ...       | ...     | ...     | ...      | ...           | 109     | ...      | 1,115       |                           |  |   |
|     |              | 1949-50 | 25             | 14             | 39            | ...       | ...     | ...     | ...      | ...           | 18      | ...      | 365         |                           |  |   |
| 5   | Lakhat       | 1937-38 | 1,384          | 5              | 1,389         | ...       | ...     | ...     | ...      | ...           | 264     | ...      | 120         |                           |  | This port is in the Khorit creek with a high tidal range (15 ft.).  |
|     |              | 1938-39 | 1,586          | 12             | 1,598         | ...       | ...     | ...     | ...      | ...           | 220     | ...      | 95          |                           |  |   |
|     |              | 1948-49 | 1,105          | 444            | 1,549         | ...       | ...     | ...     | ...      | ...           | 71      | 2,020    | 112         |                           |  | The present traffic in the ports of Jakhau, Koteswar and Lakhat is very low, but with the Salt Works going into production, the tonnage is likely to go up.   |
|     |              | 1949-50 | 765            | 1,125          | 1,890         | ...       | ...     | ...     | ...      | ...           | 57      | 2,892    | 173         |                           |  |   |

NOTE.—(1) Kutch Ports have practically no dredging or cargo handling equipment nor storage godowns.  
(2) Imports predominate, indicating that Ports have been serving as distributing centres.

(3) Budgets for all Kutch Ports :—  
Receipts. Expenditure.  
Rs. Rs.

## • APPENDIX XII

*Statement showing the number of passengers embarked and disembarked at the Minor Ports in the Bombay State during the financial year 1949-50 and 1950-51 (from April to January).*

| Serial No. | Name of the Port  | No. of passengers embarked and disembarked |          | Remarks                             |
|------------|-------------------|--|----------|-------------------------------------|
|            |                   | 1949-50                                    | 1950-51  |                                     |
| 1          | Mora . . .        | 3,11,734                                   | 2,06,510 | This is a sub-port of Mora.         |
| 2          | Nahava . . .      | 11,780                                     | 11,283   |                                     |
| 3          | Rewas . . .       | 2,94,455                                   | 2,21,846 | These two are sub-ports of Karanja. |
| 4          | Dharamtar . . .   | 1,67,415                                   | 1,20,277 |                                     |
| 5          | Mandwa . . .      | 8,546                                      | 5,552    |                                     |
| 6          | Murud (Janjira)   | 36,418                                     | 28,359   |                                     |
| 7          | Shriwardhan . . . | 42,270                                     | 34,053   |                                     |
| 8          | Harnai . . .      | 68,920                                     | 54,852   |                                     |
| 9          | Dabhol . . .      | 1,27,787                                   | 84,626   |                                     |
| 10         | Palshet . . .     | 4,896                                      | 6,344    |                                     |
| 11         | Boria . . .       | 5,378                                      | 7,665    |                                     |
| 12         | Jaigad . . .      | 53,018                                     | 35,325   |                                     |
| 13         | Varoda (Tiwri)    | 8,721                                      | 11,772   |                                     |
| 14         | Ratnagiri . . .   | 1,20,354                                   | 87,318   |                                     |
| 15         | Purnagad . . .    | 4,704                                      | 15,751   |                                     |
| 16         | Jaitapur . . .    | 54,987                                     | 38,901   |                                     |
| 17         | Vizayadurg . . .  | 50,735                                     | 41,455   |                                     |
| 18         | Deogad . . .      | 52,925                                     | 43,510   |                                     |
| 19         | Achra . . .       | 8,021                                      | 6,676    |                                     |
| 20         | Malwan . . .      | 67,952                                     | 55,840   |                                     |
| 21         | Vengurla . . .    | 36,786                                     | 32,202   |                                     |
| 22         | Karwar . . .      | 3,291                                      | 2,973    |                                     |
| 23         | Tadri . . .       | 315  | 230      |                                     |
| 24         | Kumta . . .       | 1,413                                      | 1,147    |                                     |
| 25         | Bhatkal . . .     | 1,075                                      | 1,750    |                                     |
|            | Okha . . .        | 3,951                                      | 9,098    |                                     |

NOTE.—Figures for 1950-51 are available for 10 months only from April, 1950 to January, 1951.

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Statement of dredgers available and their present condition.

| No.  | State owning the dredger | Usual place where the dredger is stationed | Type of dredger                    | No. available | Year of manufacture or brought into use | Brief description, size, power, capacity etc.  | Maximum depth that the dredger can cut to | Nature of soil that can be dredged | Present condition   | Fuel | Auxiliary equipment  |
|------|--------------------------|--|------------------------------------|---------------|---|--|---|------------------------------------|---|------|--|
| I    | Madras                   | Kakinada.                                  | Suction dredger "Abhand Godavari". | 1             | About 1936                              | Steel non-self-propelling pontoon suction dredger, 90' x 26' beam—100—H. P. 160.   | 12 ft.                                    | Sand and silt.                     | Fair—not efficient.   | Coal | Pipeline on floating pontoons in fair condition.<br><br>3 Hopper barges in poor condition.<br><br>18 pontoons, 400' floating pipeline and 100' shore pipeline Dia of pipe 12".<br><br>24 pontoons 600' floating pipeline and 100 ft. shore pipeline.<br><br>Five silt punts. |
|      |                          |  | Bucket Dredger "Coco-mandal".      | 1             | 1900                                    | Bucket dredger was a dual purpose suction dredger also. Flaming and Ferguson—builders.   | 20 ft.                                    | Do.                                | Non-working condition. Requires thorough re-plating and overhaul in dry dock. | Coal |  |
|      |                          |  | Grab Dredger "Coco-mandal".        | 1             | ...                                     | Prestman Grab Dredger on pontoon, 50' x 20' x 5' with grab 3/4 c. yd.  | 20 ft.                                    | Sand, silt and clay.               | Fair working condition.   | Coal |  |
|      |                          |  | Suction Dredger "Est-kine".        | 1             | About 1936                              | Steel non-self propelling pontoon Suction Dredger 90' x 20' Horse power 160—Comage 100.  | 12 ft.                                    | Do.                                | Fair  | Coal |  |
|      |                          |  | Grab Dredger "Naga".               | 1             | ...                                     | Prestman grab dredger on pontoon, 50' x 20' x 5' with grab 3/4 c. yd.  | 20 ft.                                    | Do.                                | Non-working condition. Being overhauled and repaired and reconditioned.       | Coal |  |
|      |                          |  | Suction Dredger "Gout-pur".        | 1             | About 1936                              | 12' cutter suction dredger 90' x 20' x 6'. Constructed by M/s. Fleming and Ferguson.   | 12 ft.                                    | Do.                                | Fair  | Coal |  |
|      |                          |  | Grab Dredger.                      | 1             | ...                                     | Prestman grab dredger on pontoon, 50' x 20' x 5' with grab 3/4 c. yd.  | 20 ft.                                    | Do.                                | Fair  | Coal |  |
|      |                          |  | Tuticorn.                          | 1             | 1931                                    | Steam ship twin screw hopper bucket dredger 175' x 30' x 15' x 13' 05"—L. H. P. 800—Hopper capacity 500 tons.  | 12 ft.                                    | Sand, hard coral formations.       | Poor, overworked, recently repaired at great cost.                            | Coal |  |
|      |                          |  | Portbunder.                        | 1             | 1924                                    | Non-propelling wooden hull 80' x 30' x 30' x 8'. Capacity of dipper 1 cubic yard.  | 20 ft.                                    | Rock, clay, sand mud.              | Hull requires very early replacement.   | Coal |  |
|      |                          |  | Versval.                           | 1             | 1924                                    | Non-propelling steel hull 80' x 30' x 30' x 8'.  | 20 ft.                                    | Rock, clay, sand and silt.         | Hull requires replacement.  | Coal |  |
| II   | Saurashtra               | Bhavnagar.                                 | Suction Dredger "Mar-vijaya".      | 1             | 1934                                    | Self-propelled suction dredger 23' P.L. for reclamation 203' x 34' x 15'. 800 ton hopper capacity.   | 20 ft.                                    | Sand and soft mud.                 | There is a proposal to convert this to oil firing.                            | Coal | 6 ton rock cutting chisel.<br>2 hopper barges, 90 tons each.<br>6 ton rock cutting chisel.<br>2 hopper barges 90 tons each.  |
|      |                          |  | Suction Dredger "Reclamer".        | 1             | 1931                                    | Non-propelling suction dredger, 23' P.L. for reclamation 203' x 34' x 15'. 800 ton hopper capacity.  | 20 ft.                                    | Do.                                | Requires new boilers. General condition poor.                                 | ...  | General condition of 17' pipeline is poor.   |
|      |                          |  | Hopper dredger "Bhava-singh".      | 1             | 1923                                    | Twin screw hopper grab dredger Hopper capacity 500 tons—One grab - size 2 of pontoon 139' x 29' x 12—8'.   | 30 ft.                                    | Clay.                              | General condition bad. Out put is low being a single grab.                    | ...  | Note—A proper machinery and hull survey of the vessels at Bhavnagar by a Lloyds or Government Surveyor is necessary.   |
|      |                          |  | Suction dredger "Sulham".          | 1             | 1931                                    | Non-propelling suction dredger 78' x 37' x 6'—3'.  | 15 ft.                                    | Sand and soft mud.                 | Too small for use at Bhavnagar.   | ...  |  |
| III. | Kutch.                   | Kandla (Major port).                       | Suction dredger "Ruk-mavari".      | 1             | 1926                                    | Suction dredger built by LEITCH. 500 ton hopper. Size 139'—6' x 29'—6' x 12—9'. Mean draft 18' 6". Displacement 803 tons. Size of suction 17'—dia. 60 N.H.P. engine. | 20 ft.                                    | Sand and silt.                     | Believed to be in very good condition.  | ...  | .....  |

Note.—The States of Orissa, Travancore-Cochin and Bombay including Orissa have no dredgers.  
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*Statement of Tugs, Launches, Barges and Lighters owned by Port Authority*

[illegible]

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## APPENDICES

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सत्यमेव जयते

# REPORT

## PART II

### INDIVIDUAL CASES



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## PART II

### INDIVIDUAL CASES

#### GENERAL

General administrative, traffic and financial matters have been dealt with in Part I. In this Part, it is proposed to deal with the Engineering and other matters concerning the individual Ports. No large scale development of Ports has been considered in these notes. Only the immediate requirements for maintaining the Ports at their present level of efficiency and capacity have been dealt with. Some of the State Governments have already been taking action on these lines subject to the limitations of finance.

#### I. ORISSA STATE

As already stated in Part I of this Report, the Orissa Government has already been investigating the question of opening a major Port in Orissa. Besides the investigations by the Central Water and Power Commission, the Government has also had the advice of some French Civil Engineers. Until the major Port question is decided, the State Government is naturally not for committing itself for expenditure at the existing Ports. There are however certain minor works which are to be carried out irrespective of the major Port question, unless it is proposed to let the existing Ports fade out.

Plans of the Orissa Ports should be prepared as no detailed plans exist now. The rates and charges for landing and shipping can be enhanced. Rules and Regulations have to be drawn up in the form of a Manual for working of the Ports.

#### INDIVIDUAL PORTS

##### (a) GOPALPUR

Gopalpur is at the south-eastern end of Orissa. Geographically it would be very desirable to have a good minor Port at Gopalpur serving the hinterland of the Ganjam District with the rich forests at Russelkonda.

The Sailing Vessels Committee (May 1949) recommended in para. 72 of its Report "Orissa may be encouraged to open out at least two good Minor Ports with Port facilities". Gopalpur should certainly be one such.

The 5-fathom line is within half mile and ships can visit practically all the year round except when a storm is actually on. Sufficient godown accommodation is available.

Although the groundnut and passenger traffic is gone for good, coastwise exports of timber, grains, cashewnuts, turmeric and imports of dhalls, grams, piecegoods etc., may be expected to revive. If the Railway connection to Russelkonda is put in, Gopalpur Port could deal with the export of forest produce. A traffic of 8 to 12 thousand tons per annum may be expected at this Port.

*Works suggested.*—A suggestion to construct an R. C. Pier 1200 ft. to 1500 ft. long jetting into the sea was made in 1946-47 by the Port Officer to the

Orissa Government and no action has been taken. The proposal would cost about Rs. 15 lakhs and cannot be financially justified. A fleet of 40/50 ton lighters would have had to be provided in addition.

To start with, it is suggested that traffic at this place should continue to be carried from shore to ship by masula boats. Facilities for loading into masula boats may be given by providing a wharf at the Gopalpur Backwater (as at Bhimlipatam) 3 ft. depth of water at wharf would suffice. The Bar which forms at the sea end of the Backwater should be cut just enough to let masula boats to go in and out. The outlet for the Backwater at freshets should be restricted to about 100 ft. width by training works to induce a self scouring velocity. The sand removal can be done by manual labour at suitable tides, but with a grab dredger borrowed for a few months, it would be easier. The works will consist of :—

- (i) A 200 ft. wharf wall at a cost of about Rs. 50,000 including levelling and surfacing behind the wall.
  - (ii) Removal of sand and dredging at wharf and approach channel.—Rs. 1,00,000.
  - (iii) Groynes and training works.—Rs. 1,00,000.
  - (iv) Subsidy to Masula boat owners to repair and/or construct and maintain about 50 masula boats.—About Rs. 25,000.
  - (v) Miscellaneous such as Roadways, water supply etc.—Rs. 25,000.
- Total.—Rs. 3,00,000.

It is suggested that a detailed survey of the Backwater may be made and plans prepared on the lines indicated above. Detailed estimates at the present day rates may also be worked out. The cost of survey and preparing the estimates should not exceed Rs. 5,000 which could be met from the balances in the Gopalpur Minor Ports Fund.

#### (b) CHANDBALI

The importance of Chandbali is as an interior distributing Port for the requirements of the rural people. Being at the very heart of the rich rice growing area of Orissa, the surplus can be exported from here *via* the river Damra to other parts of India. This Port would continue to be a useful minor port of Orissa even after the opening of a major Port, unless the latter is located on the same river. Chandbali is 38 miles from the sea anchorage.

The nearest railway station—Bhadrak, on the B. N. Railway Waltair—Howrah line—is 34 miles. The road from Bhadrak to Chandbali is being tarred but there are too many points at which the road is subject to inundation during heavy rains.

It has been suggested under the para relating to “Administration” that the administration of this Port should be brought directly under the Revenue Commissioner.

The traffic prospects of the Port are not very encouraging as no new traffic other than rice can be expected. The present requirements of the existing Port are given below :—

- (i) *Jetties*.—All the four timber jetties require strengthening and repairs, replacement of bracings and lateral stiffening.
- (ii) Purchase of 6 can buoys.

- (iii) Purchase of six mooring chains 15 fathoms each and 1½" dia. stud link.
- (iv) A slipway supported on piles running down to low water and rising to 3' ft. above highest high water and suitable for taking an 80 ft. long craft end on. This slipway would cost about Rs. 2 lakhs and is necessary to keep the Port craft in a good state of maintenance and repairs.
- (v) The purchase of an echo sounder—about Rs. 15,000.
- (vi) Provision of a Workshop for repairs and maintenance of craft, buoys, moorings etc., including a welding machine—lumpsum Rs. 50,000.
- (vii) Fencing approaches etc.

The total expenditure on items (i) to (vii) will be about Rs. 4 lakhs. The expenditure is non-remunerative but necessary to keep Chandbali going efficiently.

The question of avoiding the expenditure on slipway by sending the craft to Calcutta or Vizagapatam for overhauls and repairs was considered. Apart from the fact that such repairs involve long voyages in open sea and long absence from Chandbali, the recurring expenditure is likely to be high.

A complete river survey from the sea anchorage up to and one mile up stream of the Port is necessary. A part of the work has been, it appears, carried out by the Central Water and Power Commission, but the Port Officer, Orissa, has no information or records.

## II. MADRAS STATE

*Introductory.*—The Madras Minor Ports Organisation requires strengthening by the addition of a permanent Marine Survey Organisation and the acquisition of survey equipment such as an echo sounder, lead sounding chains, sextant, binoculars etc.

The Chairman or a representative of the Municipality should be a member of all the Port Conservancy Boards.

A total sum of about Rs. 25 lakhs may be advanced by the Madras Government to the individual Ports noted below for carrying out their essential requirements.

## INDIVIDUAL PORTS

### (a) KAKINADA

This Port on the east coast about 90 miles south of the major Port of Vizagapatam was a prosperous and promising port before the recent world war. After the war, the trade has declined considerably without any prospect of reviving. The principal items in the pre-war period were the import of petrol and mineral oils and the export of groundnuts. These formed 70 per cent. of the total trade. Both the above have gone for good and the Port is now having only the remaining 30 per cent of the trade. Even tobacco export has been an uncertain item though there has been some movement in 1950-51 and possibly some will move in 1951-52. The Port has also lost all the passenger traffic.

The average traffic in the post-war years has been about 60,000 tons per year. Even the most optimistic estimate of the near future cannot place this figure at more than 1,20,000 tons per year, i.e., double the present figure. The hinterland of Kakinada consists of a narrow strip of land between the eastern ghats and the sea limited to Tuni on the north and Vijayawada on the south. This area has a certain amount of exportable surplus of paddy or rice and tobacco and is well served by a system of inland canals. Apart from these, there is no other trade offering nor is the industrial potentiality of this hinterland such as to increase sea-borne trade. Hyderabad is too far to influence the trade at Kakinada.

Proposals for constructing a major Port at Kakinada are therefore lacking in justification even remotely. It must be admitted that from the Engineering and Marine points of view, Kakinada offers the possibilities of a protected all-weather Harbour without the evils of sand drift and maintenance dredging to the same extent as at Madras and Vizagapatam. But having regard to the heavy initial capital outlay, the prospect of an initial traffic of 3,00,000 tons at least is necessary before the scheme could even be taken up for consideration seriously. My enquiries go to show that even 1,20,000 tons per year is most problematical. If and when the Rampadasagar Project is taken up, the picture may change. The Madras Government who are sponsoring the proposal to construct a major Port at Kakinada may be requested to prepare a detailed traffic survey supported by data, of traffic likely to offer at Kakinada without counting on diversion traffic from Madras or Vizagapatam, if a major Port with two deeper water berths is constructed at Kakinada. Such a preliminary traffic survey is necessary before any time, money or effort is spent on an engineering investigation.

Having disposed of the question of a major Port at Kakinada, it now remains for me to examine what immediate improvements can and should be effected at Kakinada to make full use of its potentiality as a first class lighter Port and distributing centre.

The first and immediate necessity is to repair and/or replace the old timber jetties alongside the canal. These jetties are all worm-eaten. They were 42 in number at one time, but hardly 12 of them now exist in working condition. An estimate has been prepared for a wharf wall with R. C. C. sheet piles and is awaiting sanction of the Madras Government. This should be taken up with all urgency. Instead of one long wharf of 1100 ft. or so in length, it would be better to build 6 to 8 bits of 150' to 200' frontages with side protection wings. Such spreading is necessary to make effective use of the canal and storage accommodation which is built along the canal banks.

The completion of the new Dry Dock with the splayed walls for protection at the entrance and the installation of the pumping plant, a 1000 ft. of compound wall around the Dock and Repair Yard and the re-siting and reconstruction of the Port Workshop are the other civil engineering shore works necessary.

A new light has been sanctioned for the Godavari Point and a steel or R. C. tower has to be constructed. The groynes and pitching need repairs at places.

With regard to dredging, the bar is steadily losing depth and lighters have to wait for favourable tides before crossing same, especially in loaded condition. The intention is to keep a clear waterway at about—6.00 but recently on account of the dredger "COROMANDEL" being out of commission for a long time dredging has fallen into arrears and depths lost. The

dredger "COROMANDEL" can clear this in a short time but meanwhile whatever is possible to do with the dredger "AKHANDA GODAVARI" and the grab dredger is being done to alleviate trouble.

The dredger "COROMANDEL" which is a very old bucket dredger is being replated and reconditioned. The repairs are extensive and when finished will give the dredger a further life 10 to 15 years. "COROMANDEL" was, when originally built, a suction-cum-bucket dredger, but the suction arm was taken away and not used. The present Dredging Engineer proposes to refit same and increase the utility and usefulness of the dredger. The progress of the repair and replating work on the dredger has been badly held up for want of steel plates and when these are received, the dredger will take only 3 to 4 months to be put into commission.

The Ports of Masulipatam and Kakinada are awaiting the completion of this dredger for executing urgent dredging.

For the duration of the period that the "COROMANDEL" is out of commission, it is necessary that the "AKHAND GODAVARI" should be used to the maximum extent possible. The staff of the same should be worked longer hours and paid overtime or extra shift put on. The rubber sleeves of the pipeline attached to the "AKHAND GODAVARI" are giving trouble. Their replacement is costly. It may, in the long run, be cheaper to have Ball and Socket arrangements as at Vizagapatam Port. Enquiries may be made from Messrs. Burn & Co., Calcutta, whether they can manufacture them. If not, Messrs. Flemming & Fergusson, the makers of the dredger, may be able to supply or suggest cheaper alternatives.

The survey of the sea near the anchorage and the approach channel should be taken up as soon as possible.

The Workshop equipment at Kakinada should be improved. One portable compressor with tools and gunnite (cement gun) may be purchased.

The Kakinada Municipality may be requested to tar or concrete the road surface on the north bank of the canal and also improve the sanitation of the business area.

Summarising, the immediate requirements at Kakinada Port are :—

- (i) The repairs and/or replacements of the delapidated timber jetties by construction of R. C. C. wharf in sections.
- (ii) The dredging of the Bar.
- (iii) Expediting repairs to the dredger "COROMANDEL".
- (iv) The completion of the new Dry Dock.
- (v) Reconstruction and improvement of Workshop and equipment
- (vi) Compound wall or fencing.
- (vii) Light tower at Godavari Point.
- (viii) Marine survey.

At a later stage, a new tug or launch of not less than 150 H.P. may be added to the fleet.

Although I have stated earlier in this note that there is no scope or justification for a major Port at Kakinada, the question of developing the same into a medium size Port would be worth considering if there is any indication forthcoming of the likelihood of smaller size coastal steamers of 1500 to 2000

tons coming into use on the east coast. Kakinada Port offers a good distributing centre for the canal served delta areas. Notwithstanding what the Port Technical Committee has stated, its usefulness for small naval vessels during wars has been proved. At least one all-weather medium Port between Madras and Vizagapatam would be a great advantage. The cost of such a scheme is not likely to exceed rupees one crore including dredging and other plant and equipment and protective works. The scheme cannot be assigned a priority, but may be considered after, say 5 years.

#### (b) CUDDALORE

This is a Port on the east coast 105 miles south of Madras. The harbour is situated in the backwater which joins the sea at the south-end. The sandy bar is shallow with only 2 or 3 ft. water at low water. During the monsoon, the floods scour out and maintain a channel deep enough for lighters to move freely. The bar keeps shifting and so the backwater spillway. Some training works to confine the entrance had been contemplated but there does not seem to be any strong necessity for the same.

Although very few ships visit the Port in the monsoon period, it is possible to work all the year round except during days of actual bad weather.

Cuddalore Port has about 2500 ft. of wharf which is adequate for general purposes. A separate wharf or jetty is necessary for coal, this being an important centre for the import of railway coal by sea. The site selected for this is on the north side of the Port Office. Port owns no covered sheds but private godown accommodation is available though not adequate nor modern.

As is the case with all other Madras Ports, all lighters are private owned. There is however no tug at this Port and the lighters have not only to wait for favourable tides to cross the bar but also for favourable winds to move them between the ship in anchorage and the shore. A lot of time is thus wasted and ships are often unavoidably delayed. There is therefore a strong justification for a tug or launch. An extra charge could be levied for towing which would pay for its upkeep. A light draft tug or launch should be chosen so as to be able to cross the bar at mid-tide.

The 12" suction dredger "LORD ERSKINE" is able to keep the inner harbour dredged to —6.00 which is all that is required inside. She cannot, however, work on the bar. There is no suitable bar dredging craft with light draft to open out the sea coast entrances just to 8 or 10 ft. depth below low water. It is also difficult to predict how long such channels will keep open once they are cut. They may be closed even in one month's time by the wave action. The months of July, August and September being the worst months, any dredging done in May or June would probably endure for the season till the monsoon freshets arrive. This hope may not, however, materialise.

A Railway Siding to the "Spoil Island" has been proposed and it seems receiving consideration by the Railway authorities. This would make available large space for storage of coal and minerals and also reduce the haulage distance.

The present forecast of trade is about 3,00,000 tons per year made up of 1,25,000 tons by coal import and 1,00,000 tons of export of cement and the balance general cargo. Bauxite, Kainite etc., are likely to be exported bringing the total to about 4,00,000 tons per year which is a very good figure for a minor port. Much, however, depends on the continued use of this Port for railway coal. The rate of landing coal compares favourably with Madras.

There is a necessity for a small Workshop which may be attached to the Dry Dock. A lathe, a drilling machine and a few tools may be provided.

Summarising, the immediate requirements of Cuddalore Port are :—

- (i) The provision of a tug or launch.
- (ii) The construction of wharf or jetty for coal.
- (iii) The extension of railway siding on to the " Spoil Island."
- (iv) Minor repairs and fendering to existing wharf walls.
- (v) Provision of a small workshop with equipment.
- (vi) Improved lighting facilities for night work.

#### (c) NAGAPATTINAM

Nagapattinam is further south of Cuddalore by 70 miles. At one time, this was a very important port but now, but for the regular passenger services, the trade is very poor and forms only 0.5 per cent of the trade of the important Ports of Madras. In the years to come, Nagapattinam may revive some of its lost trade but it is difficult to forecast a trade of more than 50,000 tons per annum at this Port in the near future.

The bar at the outlet to the Kaduvayur stream keeps changing and shifting northwards. Rubble stone groynes have been put in. A sea face wall 900 ft. long with steel sheet piles had been proposed under the post-war works but the necessity for the work is not sufficient to warrant the expenditure. Sheet piles have been purchased but these may be transferred to Tuticorin where the need is greater. The warf wall at Nagapattinam has been completed and is adequate for present needs.

The grab dredger has been out of use for sometime, the pontoon being under repairs. M. S. plates for replating have just been received. The grab dredger should be brought under use without further delay. Two more mud flats are necessary for work with the grab dredger.

There is a suggestion that the Vedaranyam canal about 29 miles away should be connected up to the Kaduvayur outlet and the canal's reconditioned and maintained so as to induce self-scouring at the entrance to the Nagapattinam Port.

The Madras Public Works Department may examine the proposal technically and advise the Port authorities about its feasibility and usefulness.

The survey of Nagapattinam harbour waterways has not been done since 1920 and may be taken up by the Marine Survey Section under the Principal Port Officer when formed.

The passenger sheds at Nagapattinam should be improved. A launch for bringing or taking passengers from or to ships would be useful but cannot be financially justified.

#### (d) KOZHIKODE (CALICUT)

This is an open sea Roadstead on the Malabar Coast with a great cargo handling capacity. The Port is open only during the fair weathers and completely closed to all traffic between May/June and September/October each year. There are two piers called the North and South Pier jetting out into the sea. They are constructed of 6" screw piles 12'-0" c/crs. crossways and

14'-0" crs. longitudinally. The decking is of R. C. C. They were constructed about 1913/1915. Each pier is 775 ft. in length and is fitted with hand and steam cranes and trolley lines on deck.

The screw piles of the piers are rusted and need strengthening. The bracings and cross beams have also to be renewed at places. This work has been sanctioned and is awaiting execution.

The South Pier is the one more used by traffic. One more 3-ton steam or diesel crane on the north side of the South Pier is necessary, the present crane power being insufficient for handling bag cargo when food steamers are at Port.

Some increase in the number of trolleys are also necessary.

At the South Pier, two lines of track are urgently required to serve the transit and storage sheds and spaces. The Port is very cramped for space and can grow only longitudinally along the beach. The Port is not connected by railway. The two piers are not also connected with each other. It may be worthwhile eventually to connect the two piers by a trolley line. The pier has been lit by electric lights but the lighting is inadequate. Covered accommodation for transit purposes is also inadequate. One shed is being constructed and one more is necessary at each pier.

The North Pier area is open to the public road. It is desirable to fence off the portion and to request the Municipality to tar the roads in the vicinity to keep down the dust.

Water supply at the Port is very poor. There are two wells from which the water is drawn and taken to the lighters and sailing craft and sometimes to the ships also. As it may be a long time before a protected water supply is installed by the Municipality, some immediate works are necessary. The wells may be improved by silt clearance and cleaning, a Mayers pressure pump installed and pipes laid on to the piers with hydrants.

A third pier was once suggested for Calicut but there appears to be no necessity. During the monsoon season, the lighters and barges are laid up at Kalai, a place 2 miles south of Calicut. One tug to tow the lighters from and to the steamers at anchorage is required. This tug could also be used at Kalai and Beypore when necessary.

At Kalai, the portion of the river west of the Railway Bridge is used as a timber pond and vast quantities of timber logs lie there for seasoning and awaiting shipment. There was once a proposal to dredge the river mouth but the proposal was given up as the sand bar is certain to reform very soon.

Summarising, the immediate requirements of Kozhikode are :—

- (i) Repairs to Piers.
- (ii) Extension of trolley lines and trolleys.
- (iii) Fencing at north pier.
- (iv) Increasing storage accommodation.
- (v) Water supply.
- (vi) Provision of a tug.



## (e) BEYPORE

Bey pore is a sub-port of Kozhikode (Calicut) and is about 6 miles south of it. There is 15 ft. of water in the river just inside of the bar. The deep water extends to a long distance up the river. The south bank of the river was once the terminus of the late S. I. Railway. A large number of tile factories are situated along the banks of the river and the chief trade is the export of tiles and timber. The depth of water over the bar varies from 3 ft. in summer to 7 ft. after the rains. Being exposed to southwest monsoon, the bar is unsafe for navigation. The bar is however steady and does not shift position.

The Government of Madras have been investigating the possibility of developing Bey pore Port for coastal steamers. After scrutiny of the charts and recent soundings taken, I find that Bey pore is a very suitable place for construction of a medium size port for taking coastal steamers of 1500/2000 tons and drawing about 15 to 18 ft. The initial dredging will cost about Rs. 5 lakhs at about Rs. 2-4-0 per cubic yard. This includes the bar dredging as well as a leading channel and removal of shoals in the inner harbour. A sea groyne on the south side is essential to afford the necessary protection during the monsoon and to prevent or control the movement of said inshore. The length of this has to be determined at site but to start with, a length of 1000 ft. will be necessary. A further extension may be made if found necessary. The cost of a rubble stone groyne of the above description with additional strengthening at the sea end would be about Rs. 5 lakhs.

Other necessary items of expenditure would be :

- (i) Laying buoys and moorings in the river for ships and for marking off the channel.
- (ii) A wharf wall for lighters and country craft.
- (iii) Transit and storage accommodation, lighting, road access etc.

A sum of Rs. 15 lakhs would be required in all—Rs. 5 lakhs for dredging, Rs. 5 lakhs for protective works and Rs. 5 lakhs for other Port works and equipment—to open a new medium size Port at Bey pore. Even this outlay could be justified financially as sufficient trade can be attracted but the trade of Calicut will suffer seriously.

The dredging of the bar and channel requires a suction hopper dredger of the type of " Gertrude Grigg " at Cochin Port. Indeed, it may be possible to borrow that dredger if the construction of Bey pore as a medium size Port is taken up. Some maintenance dredging is no doubt to be expected but quantitatively it is not expected to be more than a tenth of the original dredging, *i.e.*, about 30,000 tons per year. This should not prove beyond the capacity of the Port to bear.

Before undertaking dredging, borings should be taken to eliminate the possibility of rock within 15 to 18 ft. below low water.

Once the Port is opened, the possibilities of expansion are great especially if Bey pore is connected by a railway siding from the main west coast line of the Southern Railway system. Two deep water (15' to 18' ) quay berths could be constructed.

There is no justification for constructing a major Port as no traffic of any magnitude other than timber and tiles could be expected through this Port.

A 15—18 ft. medium size Port would be justified only if ships of medium size—1500 to 2000 tons—come into wider use than at present and the present Port of Calicut is closed down.

(f) MANGALORE

The Port of Mangalore on the Arabian sea at the Junction of the rivers Netravati and Gurupur is important for trade. It is the southern terminus of the passenger steamer traffic on the Konkan coast. It is also the terminus of the westcoast branch of the Southern Railway system. Communication with the Laccadive Islands is through Mangalore Port. The coastal strip between the western ghats and the Arabian Sea is cut up by a series of rivers. Communications on the coastal belt are therefore difficult. Mangalore is also ill served by roads from the hinterland.

Among the Ports directly under the control of the Principal Port Officer, Madras, Mangalore ranks first. It ranks next to Tuticorin in the volume of trade handled. Mangalore suffers from all the disadvantages of a river mouth Port with a bar forming rapidly. At Mangalore, the entrance channel is said to be rarely shallower than 8 ft. so that lighters and sailing craft can enter the Port nearly always. The sea at the anchorage is, however, too rough for the handling of cargo and passengers during the monsoon and hence the Port is practically closed for 4 or 5 months each year.

The points for consideration at Mangalore are :—

- (i) The development of Mangalore as a major port.
- (ii) A modified scheme for the development of an all-weather port at Mangalore.
- (iii) The works and equipment necessary for an immediate improvement of Mangalore as a good lighterage port.
- (iv) The formation of a Port Trust for Mangalore on the lines of the Tuticorin Port Trust.

These are commented upon in detail below :

(i) *Major Port.*—The West Coast Major Port Development Committee after careful consideration of all factors came to the conclusion that a major port was necessary between Marmugoa and Cochin. After eliminating other sites, there was more or less a tie between Mangalore and Malpe. Although several factors and potentialities were in favour of the selection of Mangalore, Marine considerations led to the rejection of Mangalore and selection of Malpe as a more suitable site. It was feared that it may not be possible to maintain a deep dredged channel through the bar without excessive expenditure on maintenance dredging. The recommendation of the West Coast Major Port Development Committee was further considered by the Central Board of Transport and on the Board's recommendation the Government of India suggested to the Government of Madras that the question of improving Mangalore Port should be given further consideration and to this end, model experiments should be conducted at the Hydraulic Research Laboratory at Poona with a view to establishing the feasibility or otherwise of maintaining a dredged channel. Arrangements have been made by the Madras Government to furnish the necessary data to the Poona Laboratory. The results of the model experiments are awaited.

The rejection of Mangalore as a site for a major Port by the West Coast Major Port Development Committee need not, in the opinion of the undersigned, be considered final. The question of site may be reopened if

in the opinion of the Director of the Hydraulic Research Laboratory after the model experiments are made, a dredged channel can be maintained at Mangalore.

Pending the Poona investigations, nothing further can be done at Mangalore except keeping careful records of floods, currents, soundings etc.

(ii) *Modified scheme.*—The Kanara Chamber of Commerce prepared a modified scheme for developing the Port of Mangalore into an all-weather Port capable of accommodating motor and steam vessels drawing upto 12 ft. This depth was to be gradually increased to 22 ft. The initial stage was expected to cost Rs. 40 lakhs. The weakness of the scheme consisted in the uncertainty regarding the possibility of keeping the entrance open—the very point referred to Poona. No doubt the problem of dredging and keeping open a 12 ft. deep channel would be much simpler to that of keeping a 30 ft. channel open for a major Port. It is however desirable not to prejudice the case and also the detailed layout by embarking on a minor scheme when the feasibility of a major scheme is being considered on technical grounds. For instance, the sea entrance to the minor (Rs. 40 lakhs) scheme is at the mouth of the Netravati whereas it is quite possible and probable too that in a major port scheme, the entrance may avoid the river mouth altogether and be further away from it. Thus, it would be in the interests of Mangalore itself not to commit itself to a minor scheme that may come in the way of a major scheme. A medium size port at Mangalore open to ships drawing 15 to 18 ft. may be taken into consideration as soon as the results of the Poona experiment are known.

(iii) *Immediate requirements.*—There are certain works which can be taken up and certain equipment provided irrespective of whatever decision may be taken with regard to the future development of the Port.

The waterways in the inner harbour alongside wharves, *i.e.*, between the sandspit and the mainland, have been silted and should be dredged and maintained to at least 8 ft. below low water. There are also some shallow areas along the Netravati river. A grab dredger and mud flats are necessary for this purpose. The present lighthouse is on the mainland. Being in the middle of a built up area, it cannot be easily picked up. The height of the lighthouse tower is also not sufficient. It is suggested that a new lighthouse tower be constructed at the sandspit and the present light transferred thereto. As a corollary, quarters have to be constructed there for the lighthouse keepers. The Principal Port Officer, Madras and the Deputy Superintendent of Lighthouses, Bombay, also agree with this. The cost of the proposal is estimated to be about Rs. 50,000.

A passenger shed is under construction. The size is too small. It has also to be furnished and electrified. Another shed of the same size may be constructed at a cost of about Rs. 20,000.

The reclamation area requires to be provided with electric lights at a cost of about Rs. 10,000.

The north wharf wall requires realignment and reconstruction with deeper foundations. This is the busiest area for general cargo. Cost about Rs. 1,50,000.

A new Workshop building at a cost of Rs. 12,000 and equipment such as lathe, drilling and punching machines, air compressor with tools etc., are very necessary and would help maintenance and repairs of plant and craft. The present pump at the Dry Dock is a small one. A big pump run by electric motor would save the time of the dock dewatering.

It is suggested that an engineering supervisor who could also be trained in marine survey should be posted at Mangalore.

The tug power at Mangalore needs augmenting.

Mangalore has a Pilotage Fund and employs locally trained pilots for piloting country craft. These are, however, not Government servants but are paid out what is recovered from the craft piloted by them. Piloting is now optional. The system is likely to lead to abuses. It is suggested that Pilotage should be made compulsory for all craft over 15 tons and that 12½ per cent of the collections be retained by the Port for building up the Pilotage Fund. If necessary, the existing rates may be increased so as not to reduce the present earnings of the Pilots.

Summarising, the immediate requirements of Mangalore Port are :

- (i) The purchase of a grab dredger and hopper barges.
- (ii) The dredging of the inner harbour.
- (iii) The shifting of the lighthouse to the sandspit and connected works.
- (iv) The construction of a workshop and improving the equipment.
- (v) The provision of a good electric pump for the dry dock dewatering.
- (vi) The provision of another passenger shed and furnishing same.
- (vii) The lighting of the reclamation area.
- (viii) Realignment and reconstruction of the north wharf wall.
- (ix) The provision of an extra tug for towing.

(iv) *Formation of a Port Trust.*—I have recommended in Part I of my Report that the request of the Mangalore merchants and public for a Port Trust to be formed at Mangalore may be agreed to. The success of the Port Trust at Tuticorin has encouraged the growth of such idea at Mangalore, the next more important port of the Madras State.

From the point of view of traffic and finances, a steady improvement is noticed in the post-war period.

The disadvantages of separation from the Madras Ports organisation are mainly with regard to Mechanical and Civil Engineering assistance and also advice and superintendence at higher level, i.e., the Principal Port Officer. On the other hand, these advantages are off-set by the disadvantages of remote control and the various limitations of such centralised control.

After considering the pros and cons, I am inclined to think that it would be advantageous to form a Port Trust for Mangalore and give the Mangalore people an opportunity to develop their own Port through their own resources and loans. The most encouraging factor is that the Mangalore public are enterprising and enthusiastic over the proposal and can be trusted to make the Port Trust a success. They are prepared to tax themselves by raising the landing and shipping and other charges according to needs. For some time to come, they will have to continue to depend on the Principal Port Officer's staff for technical assistance and there seems to be no objection to provide this, if necessary, on payment.

The Port Trust, if agreed upon, should be launched on an even keel without any encumbrances on the one hand or provision of a share of the Madras Minor Ports Fund on the other. The Madras Minor Ports Funds should, however, retain liability for the cost of shifting the lighthouse and the initial dredging, as well as the cost of the present investigations at Poona.

As regards the executive side, it should be possible for the Government of Madras to lend one of their Port Officers on a tenure basis to work as Port Officer and Secretary to Port Trust, Mangalore, on the same lines and terms as at Tuticorin. Similarly it should be possible for the future Port Officer of Mangalore to continue to be in charge of the Minor Ports of South Canara for and on behalf of the Principal Port Officer, Madras, again on the analogy of the Port Officer, Tuticorin.

#### (g) TUTICORIN

This is one of the most important ports of Madras and is situated in the Gulf of Mannar being almost the southern most Port of India. This Port has also the unique distinction of being the only Port which though classified as a minor Port is constituted into a Port Trust.

The unique position of the Port of Tuticorin explains why for decades it has been one of the largest Ports in South India. It is situated well up the almost land locked Gulf of Mannar which is rarely visited by storms. The harbour itself has the shape of horse-shoe with the opening towards the inside of the Gulf. It is therefore a fine natural harbour with calm water inshore throughout the year.

At one time it was the fifth Port in India and it was because of its antiquated methods of landing and shipping cargo that it has fallen behind and at present stands as the third in the Presidency and first in rank among the minor ports. The nearest modern ports to Tuticorin are Madras and Cochin. There is therefore ample country for Tuticorin to tap without affecting either of these Ports and this Port is moreover the natural outlet for goods from South India to Ceylon.

In 1920, the firm of Sir John Wolfe Barry Lyster and Partners reported to Government of Madras that "Tuticorin both from its physical advantages and future trade prospects is the most promising of the five Ports upon which we are asked to report (the others being Nagapattinam, Mangalore, Malpe and Cocanada)."

Construction of a harbour was started at an estimated cost of Rs. 40 lakhs increased later on to Rs. 57 lakhs major portion to be financed by loans from Government. This estimate provided only for a harbour with an approach channel at Hare Island with no wharves, sheds or railway connecting the mainland etc. The alternative schemes were then recommended by an Expert Committee appointed, costing Rs. 160 lakhs and 120 lakhs respectively. A request for a free grant for expenditure in excess of Rs. 60 lakhs was refused by the Governments of Madras and India and any expenditure in excess of Rs. 60 lakhs was beyond the financial capacity of the Tuticorin Port Trust. So the whole work was abandoned early in 1930 after spending about Rs. 31 lakhs. As the new harbour was under construction no major improvements to the old Port at the mainland were carried out. But after the harbour construction was abandoned, the finance of the Tuticorin Port and Port Trust Funds was used for the repayment of the loans from Government and no major improvements could be carried out. In 1939 War broke out and due to the dearth and very heavy cost of labour and materials, no improvements were then possible.

In 1946 the Government of Madras approached the Government of India for pursuing the Tuticorin Harbour scheme and converting it into a deep sea Port at the cost of the Government of India. The latter Government

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considered that the scheme required fuller examination in the light of the failure of the Tuticorin Project in 1926-30 and suggested that no useful action should be taken till the Ports Technical Committee had reported on the various Port development schemes. A few years later, the Madras Government at the instance of the Tuticorin Port Trust wanted to arrange for the necessary technical examination. Quotations were obtained from Messrs. Rendell, Palmer & Tritton for conducting a preliminary investigation of the scheme. The cost of the preliminary investigation was estimated to be about £5,000 and the Madras Government asked the Government of India either to bear the entire cost of the investigation or atleast half of it. After a few more discussions between the two Governments, it was decided to postpone the question for a further period of 2 or 3 years. In November 1950, the question was again taken up. The Government of India stated that in view of their commitments, it would not be possible to provide funds for any large scale expenditure at Tuticorin nor did they consider it necessary to carry out the technical examination long before the possibility of taking up any schemes. The question was thereafter left to be commented upon by the Officer on Special Duty (Minor Ports).

The feasibility of construction of a deep water harbour at Tuticorin is not free from doubts. According to Mr. Bristow's report of June, 1926, "There is one hard layer roughly between 12 ft. and 16 ft. below low water and a very hard layer roughly between 24' and 27' below low water. There is little difficulty in dredging the material down to 24 ft. below low water but great difficulty in dealing with the second hard layer."

According to some other old notes of June 1919, in the Port Office "In dredging operations, sand and mud was found up to about 12 ft. after which, hard shell conglomerate was struck which the dredger was able to break up with her old buckets in all the fleets she made for test purposes up to 20 ft."

Detailed information about the borings taken by Mr. Bristow—their location and records of strata—are not traceable in the Port Office at Tuticorin nor in the Principal Port Officer's office, Madras, nor at Cochin Port whereto, it is said, that Mr. Bristow took the records. A further vigorous search must be made at all the above places to trace the old records.

It is obvious, however, from the few records available and from the statements of old residents and employees of Tuticorin Port that rock has to be reckoned with at 11 to 12 ft. depth. If, according to Mr. Bristow's estimate, further very hard rock is to be expected at 22 to 24 ft. depth, the feasibility of opening a major Port with a depth of 25 to 30 ft. itself becomes questionable. From personal experience of subaqueous rock cutting below 20 ft. of water at Vizagapatam, I can say categorically that rock removal in depths of 20 ft. or above would be extremely arduous in execution and staggering in cost.

The possibility of constructing a major Port at Tuticorin is dependent entirely on the geological conditions and unless data is collected, no firm opinion can be given. It may be possible to find another site for the construction of the harbour and some miles away from the present harbour but the failure of the Hare Island Scheme makes such experimental explorations extremely dubious. Moreover, if we get too far away from an established place like Tuticorin Town and Port, it will take decades to build up trade and business centres at the new place.

The construction of a medium size Port to a depth of 25 ft appears to be feasible from an engineering point of view and would not be financially too great a commitment.

Although the present financial position may not permit of large expenditure on new schemes for a few more years, I consider that a small expenditure now of £5,000 on technical investigation would be justified. The terms of reference may be restricted to a preliminary investigation into the feasibility of construction of a major port at Tuticorin and the main features and approximate cost thereof.

Detailed designs, traffic survey and finances etc., could form the subject matter of a later investigation if the preliminary report is favourable and costs not prohibitive. The consulting engineers may require data such as borings which would take a long time to collect. The investigation itself may take one or two years and therefore it is desirable to start the same.

This investigation may, if possible, be combined with the investigation of the question of deepening the Pamban Pass dealt with elsewhere in this note.

Having dealt with the question of developing Tuticorin Port, I now proceed to report on the immediate requirements.

The Port Trust have had in mind since 1946 a programme of improvements and at a meeting with the Sub-Committee of the Port Trust Board, the items were examined individually. My remarks are given against each.

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| (1) Construction of a new Coal Wharf with interlocking steel sheet piles—Original estimate sanctioned by the Government of Madras—Rs. 2,40,000. | Tuticorin is being increasingly used for railway coal brought from Calcutta by steamers. The present berthing facilities are not adequate, and coal cannot very well be stacked along with the general cargo. Hence this item is necessary.   |
| (2) Purchase of a tug for towing boats—Rs. 1,00,000.  | This has already been recommended by me in Part I of my Report under item 20 and is very necessary. The estimated cost is however on the low side and may be raised to Rs. 2,50,000.  |
| (3) Providing a 20-ton heavy left crane—Estimated cost Rs. 1,00,000.  | This item is desirable, but not essential and may be postponed to a later date.   |
| (4) Providing Railway Sidings along wharves at foreshore—Rs. 45,000.  | This item is essential for movement of rail-borne traffic. There is very little space for a good Marshalling Yard for dealing with Port Traffic, but a Siding along the wharves would serve to collect the loads from lighters or <i>vice versa</i> .   |
| (5) Purchase of a Grab Dredger and 6 Mud Punts—estimated cost Rs. 5,00,000.   | The purchase of a Grab Dredger and hopper barges for Tuticorin has been recommended by me under item 14 of Part I of my Report. Mud Punts may be substituted for hopper barges if so desired. The total cost would be about Rs. 4 lakhs and Rs. 1 lakh may be saved on the estimate. This is one of the most urgent items, because practically the entire length near the wharf and piers is silted up. An order should be placed immediately as it takes nearly 2 years to get the supply. |

- (6) Re-conditioning to existing dock and providing electric pump sets, pump-house and gauge—Estimated cost Rs. 1,00,000. The repairs to the Dock are necessary for attending to the repairs to the dredger tugs and in future the Grab Dredger also. A certain amount of income can be derived by hiring the dock for the repairs of private fleet including those of Fisheries Department. The estimate, however, seems to be on the low side and may be increased to Rs. 2,00,000. In this connection, it should be mentioned that under the 1946 Post-War Scheme, a sum of Rs. 8 lakhs had been provided for the construction of a Dry Dock. This heavy expenditure can be saved by repairing the existing one. In this connection, the Town drainage which debouches right into this Dock, has to be diverted. At present, the Tuticorin Dredger is taken to Mandapam for repairs. A considerable amount of time is lost and it is also very expensive. For these reasons, the repairs to the existing Dock is justified.
- (7) Shifting Coal Cooly lines further north—Estimated cost Rs. 25,000. This is necessitated by the need for stacking ground for coal and other commodities. The cooly sheds are right in the centre of a very busy area.
- (8) Construction of a new combustible stores shed—Estimated cost Rs. 10,000. The need for the above is obvious and is required to comply with the requirements of the Inspector of Explosives and Dock Regulations.
- (9) Completion of the construction of South wharf—Estimated cost Rs. 77,000. This item, which has partially been done should be completed early so as to bring it into use and relieve congestion at the other places.
- (10) Construction of a overhead tank for storage of water and necessary pipeline—Estimated cost Rs. 30,000. The rate of supply of water is not uniform and small storage at the Port is necessary to be able to supply water to shipping when urgently needed and also for shore operations.

The aggregate total cost of the above works will be about Rs. 12.77 lakhs. It will be seen that all items in the list put up by the Tuticorin Port Trust are justified and are recommended with the exception of the provision of a 20-ton heavy lift crane. It is recommended that a free or partially free grant be made to meet the cost of the above works. In making this recommendation for a free grant, the financial commitments of the Trust, past, present and future, have been taken into consideration. The Port has had to repay a heavy loan (Rs. 31 lakhs) on the Hare Island Scheme which was a dead loss. The expenses on dredging are also heavy. The cost of repairs to the dredger "TUTICORIN" which has had 20 years of life has been very heavy in the last 2 years. A further sum of Rs. 2 to 3 lakhs is necessary to complete the repairs and replating. Besides, a new dredger has to be purchased in 5 to 8 years for replacing the present dredger at a cost of about Rs. 25 lakhs. With all these heavy commitments and with the raising working costs, it may not be possible for the Port Trust to meet all these development items of expenditure, totalling to Rs. 12.77 lakhs from out of its own resources. The expenditure may be spread over to 3 years and grants at the rate of about Rs. 4.25 lakhs per year made. If, however, a free grant cannot be made due to the present financial situation the Port Trust may be either allowed to raise a loan or given a loan on easy terms.



This additional outlay of Rs. 12.77 lakhs will place the Tuticorin Port in a much better way as a good lighterage Port, capable of quick handling of cargo between the ship and shore or *vice versa*. When funds permit, certain additional works may be undertaken, such as construction of additional covered storage accommodation, construction of a wharf for firewood, heavy lift crane, travelling crane, improved facilities for export of salt, provision of a workshop with equipment etc. These may cost an additional sum of Rs. 10 lakhs, but may be postponed till all the works noted earlier have been carried out. The Tuticorin Port Fund and the Tuticorin Port Trust Fund may be combined into one General Account, the Government, however, retaining power of re-appropriation between one abstract head of account to another.

#### (h) OTHER MINOR PORTS IN MADRAS

(i) *Calingapatam*.—There has been no trade at this Port for a number of years, nor is there any prospect of early revival of trade. This could be made a sub-port of Bhimlipatam.

(ii) *Bhimlipatam*.—Bhimlipatam, 20 miles to the north of Vizagapatam, is still carrying on as an open sea Roadstead, the cargo from and to ships being conveyed by masula boats with a carrying capacity of 2 to 2½ tons. The loading and unloading is done at a wharf wall in the backwater. The passage for masula boats across the bar is kept open by hand dredging occasionally. During freshets sufficient water is available for the boats to plough through. Storage accommodation is adequate. The wharf could be improved and a shelter provided for waiting cargo against sudden outbursts. A small one-ton hand crane would also be useful to handle packages. The masula boats which are private-owned have not been kept up to full strength and efficiency except some maintained by Messrs. Ripley & Co. Some subsidy may be given to boat owners. The funds for the works proposed and the subsidy may be raised by levying a small landing and shipping fee.

(iii) *Narsapur*.—This port in the West Godavari District lies on the banks of one of the estuaries of the river Godavari known as Vasista Godavari. The river is said to be deep but the sea approach is shallow. Navigation is very dangerous now and the possible behaviour of the bar if opened out uncertain. The coast in the vicinity has not been surveyed for a long time and a survey is necessary before any opinion can be given as to the possibility of developing the Port. Ports on the east coast are subject to sand drift and there is no reason to expect that it will not also be the case at Narsapur. Any expenditure at Narsapur without a full study of the physical problems that may be confronted with is not justified.

(iv) *Pamban*.—The Pamban Pass connects the Gulf of Mannar with the Palk Bay. The railway line to Dhanushkodi crosses the Pass by a long bridge with one opening span of 220 ft. width. The navigable portion of the Pass is supposed to be 12 ft. in depth but depth has been lost due to siltation especially in the south of the bridge and in the approach to Mandapam. The lack of justification from the commercial and financial points of view of undertaking the Rameswaram Canal Scheme has been explained in the Ports Technical Committee Report (Paras. 52—59). The estimated cost of constructing the 30' canal would now be much higher than Rs. 110 lakhs and a very strong justification would be necessary to take up the Scheme. From the strategical and naval points of view, the saving in distance has gained further importance since the Independence of India. It is, however, for the Ministry of Defence to have the question re-examined and say whether they would now support at least partially the canal scheme.

The Ministry of Railways may also be approached to ascertain how far they would be prepared to support the scheme. The Southern Railway terminal facilities at Dhanushkodi are not very satisfactory. It is learnt that the Ferry between Dhanushkodi and Talaimanner Pier is run at a loss of about Rs. 3 lakhs per year. The Railway Ministry may therefore be interested in a scheme which would cut down this annual loss.

The Government of Madras had proposed in their Post-war Development Schemes of 1945 to deepen the Pamban Pass to 20 ft. with a view to allow coasting vessels of tonnage not exceeding 2,000 to make use of the Pass. This proposal has not been implemented as there has been no indication so far of the smaller steamers being brought into use on the east coast of India. This question is certainly worth pursuing. It should however be borne in mind that the depth to which the canal can be deepened is limited by the depth to which rock excavation can be done in the navigable span of the Railway bridge at Pamban without risk of damage to the foundations of the bridge piers.

The deepening of this Pass even by a few feet will be a great boon. The Tuticorin Trades Association is also interested in the scheme. Recently, a dredger and a tug have had to be brought from Cochin and Bombay to Vizagapatam. Even though the drafts were only 13 ft. each, the voyages had to be made around Ceylon. Perhaps the Navy have had similar difficulties. Some of the sailing crafts from West Coast carrying tiles have to lighten the draft by transferring their load to smaller boats. It is therefore very desirable to have this question of deepening the Pamban Pass re-examined from the technical and financial points of view.

The following information and data are necessary.

- (i) Marine Survey of the approaches to the Pass and approaches to Mandapam and the Bay in the neighbourhood. This is best done by some firm of Hydrographic Surveyors with their own equipment.
- (ii) An examination of the subaqueous rock at the opening span of the railway bridge and determination of the maximum depth to which the sill can be lowered without affecting the safety of the bridge foundations ; the method and cost of such deepening. This can be entrusted to a Civil Engineer, with harbour or bridge construction experience.

When the above information is available, a final estimate of the cost of establishing a deeper canal including dredging costs can be arrived at. All these data and estimates can then be placed before the National Harbour Board.

With regard to financing the cost of investigation estimated at about Rs. 50,000, it is suggested that the Madras Government may meet the same from the balances in the Pamban Pilotage Fund. It would first be necessary to transfer a part or whole of the balances standing at Rs. 2,67,600 on 31st March 1950 to the Madras Minor Ports Fund under the powers vested in the local Government under the Indian Ports Act or if necessary, by special legislation.

It is suggested that the investigation of this most important scheme will receive early attention.

One other minor point about Pamban which I would like to mention is the improvement of the terms and conditions of work of the Pilots so as to avoid them drifting to other trades or professions.

The south beach at Dhanushkodi has also to be protected as grave damage to the housing colony might occur if erosion continues.

The Dry Dock and slipway at Mandapam are useful assets for repair of crafts and should be kept up. Even now, the craft from Tuticorin are making use of the Dry Dock.

### III. TRAVANCORE-COCHIN STATE

All the minor ports are situated to the south of Alleppey in the former Travancore State. Alleppey is the principal port. Quillon and Trivandrum come next. The Port of Colochal has lost its importance. Koilthottam has come into prominence recently on account of mineral sands. All the ports of Travancore are open sea Roadstead ports on the Arabian Sea. None of them have any sort of natural protection.

#### (a) TRIVANDRUM

This Port situated at the capital city of the State was intended to serve all the hinterland surrounding Trivandrum and the part of the State south of it, but the expectation does not seem to have been realised. There was a pier constructed in 1913 with steel screw piles decked over with timber planks. This pier was irreparably damaged by a ship colliding with it in 1947. Compensation was realised from the Company and now a new reinforced concrete pier is being constructed by a firm of contractors of Bombay at a cost of Rs. 7.5 lakhs. The new pier jets into the sea for a length of 750 ft. and the finished width will be 14 ft.

No provision seems to have been made for cranes, lighting etc., on the new pier. Two or four cranes and a few lighters and a tug should be provided to be able to make full use of the pier when completed. Trolley lines and trollies are also necessary. When these are provided, direct food imports through this Port would be possible.

Private storage sheds are available. It is desirable to construct at least one shed for transit cargo. The approach road to the Port should be improved.

The only Port official is a Signaller on a pay of Rs. 20—25 per mensem. When pier is completed, a more responsible officer should be placed in charge.

#### (b) QUILLON

This is 44 miles north of Trivandrum and 56 miles south of Alleppey. There are many factories at the town of Quillon for processing raw cashew-nut and vacuum packing same into cases and despatch to foreign countries. Raw cashew-nut is also imported from South Africa for processing and re-despatch.

There is no pier or any other landing and shipping facility provided by the Port. One enterprising firm (Messrs. F. X. Periera & Co.) has a fleet of 4 barges, a tug and an improvised landing place. This latter consists of 2 big steel barges about 100 ft. long each placed end on end with an end piece shaped like a hinged flap. The barges are suitably anchored. Cargo barges stand by the side and are loaded by manual labour. While these last, they are a fairly convenient means of landing and shipping.

A pier similar to the one now under construction at Trivandrum would cost about Rs. 10 lakhs. Lighters can be left out to be provided by private parties.

A steady traffic of 40,000 to 45,000 tons per year may be expected here if a pier is constructed and nearly 1,00,000 tons more if mineral sands are diverted to this place instead of direct shipment from Koilthottam, 7 miles away. Koilthottam is connected to Quillon by an inland water canal. No Port facility is or can be provided at Koilthottam.

The road approach to the Port from the town should be improved. At least one godown should be constructed by the Port for transit cargo.

There is no reason why landing and shipping fees should not be levied at this Port with immediate effect. The fees may be a small one now and may be increased when full facilities are provided. The Signaller in charge on Rs. 20/25 per mensem should be replaced by a more responsible official designated as Port Conservator.

Capital expenditure of the order of Rs. 10 lakhs is recommended at this Port as soon as finances permit.

#### (c) KOILTHOTTAM

There are factories nearby for separating Monozite, Ilminite and Zircon. It is stated that these factories will soon be nationalised and they will feed the Government factory at Alwaye with raw materials. In view of the uncertainty of policy regarding export of the mineral sands, no work is proposed at this Port. In fact, it would be desirable to divert this traffic, if it continues, to Quillon Port.

#### (d) ALLEPPEY

Alleppey is the most important Port on the West coast of India south of Cochin and is also an important trade and industrial centre. There are several factories for coir products most of which are despatched to foreign countries. The Travancore-Cochin backwaters and canals converge on to Alleppey and the interior is well served by inland water transport. The lack of railway transport has not therefore had any marked effect on the trade of the Port.

The special feature of Alleppey Port is the formation of mud banks off the coast which renders the sea smooth for shipping operations. The exact behaviour of these mud banks has not been studied scientifically but they are known to shift their position. The mud bank permits of shipping during the off season also.

A pier 985 ft. long on steel screw piles, timber decked, having a width of 22 ft. and provided with 3 lines of 2' 6" gauge track, is used for the loading and unloading operations to and from 40/50 ton timber lighters. The general condition of the pier is good. Some of the cross girders and deck planking require renewal. The work of repairs and renewals to the pier is in the hands of the Travancore Public Works Department. This work has to be speeded up.

Accretion of sand is noticed in the pier.

In fact, the original length of pier was only 756 ft. An additional 200 ft. was added about 15 years ago when accretion was noticed. It is now necessary

to add another 200 ft. Boats and lighters lying on the sides of the pier are found to be tossed about too much for safe and convenient working due to surf beating. An extension by 200 ft. at an estimated cost of Rs. 2 lakhs will provide an adequate length of calm water berth for lighters.

With the extension of the pier or even without it, the crane position should be improved. Two cranes at the end of the pier are worked by winches but the steam supply to same is from a boiler 200 ft. away. Electric or deisel cranes should be provided in place of the existing ones. Two more 2-ton cranes are also required as the existing cranes cannot cope with bag cargo traffic. One 10-ton electric crane seems to have been purchased but not erected. The pier is too weak and since Alleppey is not served by railway lines, a heavy lift crane there could not be used advantageously. The crane may therefore be transferred to Trivandrum Pier. There is one 5-ton crane on the Aleppey Pier which is enough for packages of moderate size. More of small cranes would be an advantage.

Lighting on pier should be improved. The trollies need repairs. As the sheds are far away from the piers, the trollies are used fairly heavily. Spare parts such as roller bearing axle boxes must be stocked. About 12 more trollies may be purchased to supplement the existing ones.

Most of the lighters are private owned. The policy of port owning lighters has no advantages and should be resorted to only if private enterprise is not forthcoming.

One of the serious disadvantages of the place is that there is no laying up place for boats, lighters and tug during the rough weather. At present, all the craft are towed to Cochin Port and back to Alleppey via the backwaters. An attempt was made in the past to dig a boat basin but it did not show promise of success and was abandoned. No alternative solution to this difficulty is possible except at enormous cost.

The storage sheds appear to be adequate for the present but the floor is kutcha. Hard and smooth concrete flooring is immediately necessary at all the sheds. The Port Workshop is doing good work and should be improved by the addition of lathes and welding plant. New signalling apparatus is essential. It is understood that funds for this are already sanctioned.

Alleppey has two progressive, enlightened and well-informed Chambers of Commerce who are keen on developing this Port.

Summarising, the works suggested are :—

- (i) the extension of the pier by 200 ft.,
- (ii) early repairs to the existing pier,
- (iii) Provision of 2 additional cranes and replacement of 2 cranes as end by electric or deisel cranes,
- (iv) flooring of all sheds,
- (v) workshop, trollies etc.

With regard to the working of the Port, a very great deal of inconvenience and grievance is felt by the merchants on account of vagueness about Customs Rules and Regulations and lack of proper understanding and co-ordination by the day-to-day working staff who are new to the newly introduced Central Customs.

With regard to the two tugs at Alleppey, it is suggested that they should be docked annually at Cochin and inspected by a Government or Port(Cochin) Marine Officer, costs being borne by Alleppey Port.

## IV. BOMBAY STATE

The State of Bombay has a long coast line measuring about 340 miles south of Bombay city and 240 miles north of it. A large number of ports are dotted along this coast. Besides these, a few ports formerly of the Baroda State are on the Saurashtra coast.

The administration of the minor ports is conducted through the agency of the Collectors of Central Excise, Bombay, and the Collector of Customs, Saurashtra, Jamnagar. Okha is administered directly by the Government through a Harbour Board.

With regard to the administration of these Ports (except Okha) the following brief summary is given below :—

The subjects administered at the minor ports are :—

- (a) Sea Customs :
- (b) Shipping and navigation :
- (c) Central Light Houses :
- (d) Conservancy of ports, maintenance of local lights, buoys, beacons and provision of facilities for the landing and shipment of goods :
- (e) Provision of amenities for passengers embarking and disembarking.

The first three of the above are Union Government subjects and are accordingly administered by the Central Government. The last 2 are State subjects. The Collector of Central Excise, Bombay is also the Chief Customs Officer under the Sea Customs Act for item (a) above. The shipping and navigation under the Indian Merchant Shipping Act and the Indian Steam Vessels Act is administered by the Principal Officer, Mercantile Marine Department, Bombay, through the Range Officers and Assistant Range Officers in charge of the Ports. These officers are also declared as receivers of wreck under the Merchant Shipping Act.

Item (c).—Central Lighthouses are administered by the Collector of Central Excise, Bombay, who has been declared as the Superintendent of Lighthouses under the Indian Lighthouses Act. He is assisted by a Deputy Superintendent of Lighthouses. There are 10 Central Lighthouses in the Bombay State.

As regards (d) and (e), the Central Customs Collector administers these subjects for and on behalf of the Bombay Government and receives a payment of about Rs. 18,500 per annum for the services so rendered.

The port accounts are maintained by the local Central Excise Officers, and the Chief Accounts Officer, Central Excise, maintains the consolidated accounts of the two Funds, namely the Bombay Minor Ports Fund and the Bombay Landing and Wharfage Fees Fund. The budget estimates are also prepared by the Chief Accounts Officer of the Central Excise, but these budget estimates are subject to the approval of the Bombay Government. Minor works such as repairs and upkeep and white-washing of buildings etc., is carried out by the Assistant Collectors of Central Excise through their sub-ordinates. Major works, if any, are carried out through the agency of the provincial Public Works Department for which the Landing and Wharfage Fees Fund pays centage charges.

The Bombay Ports are carrying a considerable amount of coastal traffic—about one million tons per year and over 1½ million passengers travel by the coastal routes in spite of the very meagre facilities available. The coastal areas south of Bombay are very much dependent on these services for their requirements on account of the absence of convenient road and rail communications. One important difference between the Bombay Ports and the East Coast Ports is that the former deal mostly with coastal traffic with little or no foreign traffic, whereas the reverse is the case with the latter ports.

In 1937, the Bombay Government appointed a Committee to go into the question of development of some selected minor ports of Bombay. The Committee inspected a number of ports, landing places and the navigable rivers and channels leading to them. The Committee issued an exhaustive report dealing with the then condition of the ports and suggestions for dredging and other improvements, development of roads serving the ports etc.

Many of the recommendations of that Committee were not carried out due to lack of finance. The Committee's suggestions regarding raising the finances were not adequate. Anyway, the War broke out and all development schemes were shelved.

In the post-war period, the Government has been carrying out a number of small but very necessary works at several ports mainly with a view to provide amenities to passengers. Thus, in 1951-52, an expenditure of about Rs. 75,000 was budgetted against major repairs and about Rs. 1,70,000 against new minor works at the Ports of Mora, Rewas, Dharampur, Jangira, Harnam, Dabhol, Gowalkot, Ratnagiri, Musakaji, Achra, Malwan, Vengurla and Bhatkal. This policy may be continued and extended to other minor ports of Bombay. Launches should be provided at some selected ports. It is difficult to understand why no landing and shipping charges are levied on cargo. The immediate introduction of such charges and increasing the charges on passengers from one anna to two annas per head, will bring the necessary revenue to justify further improvements. An overall outlay of about Rs. 25 lakhs spread over 3 to 5 years will place the Bombay ports in a fair position.

समाप्त

Lighthouses and Beacon lights and other navigational aids are necessary at a number of places. What is required as regards shore works, such as jetties, waiting sheds, lighting, storage godowns, roads, fencing, cranes etc., is fairly well known and may be provided as funds permit. It is not possible to make specific recommendations regarding dredging required, and the manner of carrying out the same until each place is visited individually. In most places, heavy expenditure on dredging is not likely to be justifiable on even the most optimistic estimate of trade. A few important ports may, however, be selected and detailed survey and investigation made.

The Bombay Steam Navigation Co., who, and their associated companies, run and maintain most of the passenger services on the west coast, were consulted and a note submitted by the firm is enclosed (Appendix). The note contains much useful information and many suggestions. These suggestions may be placed before the Bombay Landing and Wharfage Committee and the necessary works carried out with the least possible delay.

It is suggested that the Government of Bombay should advance interest-free loans to the Landing and Wharfage Fees Fund to carry out the improvement works.

## PORT OF OKHA

The Port is on the Arabian Sea at the entrance of the Gulf of Kutch and is a well protected all the year round Harbour both at the anchorage and at the steamer berths. It has not been necessary till now to carry out any dredging either in the approach channel or at the berths or mooring basin except once by the Naval dredger Catchalot. Some dredging is however urgently necessary now.

*Approaches and Anchors.*—Approaches to Okha from seaward side is quite easy as all the shoals are well marked with large size buoys with day mark as per uniform system of buoyage adopted in India. On approaching the Port, the Samiyani Island at the mouth of the Gulf of Kutch with its light-house is first sighted. On the east, west and south of this Island, there are 3 channels 20 ft., 16 ft., and 18 ft. deep respectively at the lowest tide. The eastern channel is used by all large steamers entering the port. The outer 2 channels are mainly used by the country crafts. Steamers with 25 ft. draft can enter at the high water at any tide and 29 ft. draft at high water spring tides. The channel has sandy bottom 5,600 ft. long and 350 wide at its narrowest portion and maintains a depth of 20 ft. below mean low water ordinary spring tide. The channel is well buoyed on both of its sides and the suitable leading marks at Adtra, Beyt Island and Vomani Point are constructed on the shore land as the guidance for navigating East, South and West channels for the steamers entering the Ports. The harbour and the approach channel have been charted by the Royal Indian Marine and constant surveys are made by the local authorities to watch any changes that may form and come in the way of safe navigation.

The ships are anchored on roadstead where deep water for anchorage is available for a large number of ships to lie at anchor. The holding ground is sand and ships have not been known to drift away even in the strongest spring tides and South West monsoon. There is sufficient room in the harbour stream for one large steamer and one small steamer or for 3 or 4 small steamers simultaneously to lie at anchors abreast of pier. Maximum depth at low water is 20 ft. to 22 ft. There is also the mooring buoy abreast of the pier about 1000 ft. away for a large steamer. The maximum depth of water is 22 ft. at low water. Steamers can discharge or load the cargo at the buoy by steel barges maintained by the Port.

Okha is easily the finest minor port of India from the marine and Engineering points of view. It does not, however, command a wide hinterland. Traffic prospects are, therefore, limited. The Government of Bombay have estimated the average annual traffic at 3,50,000 tons. This figure has been exceeded in 1947-48 and 1948-49. For purposes of study of traffic trends a figure of  $3\frac{1}{2}$  to 4 lakhs tons per year may be accepted.

The Government of Bombay has estimated the revenue receipts of the Port at Rs. 7,50,000 per year. While this is all right at the present rates of charges, there is scope though not very greatly to put up the rates to the levels prevailing at Major Ports for similar services. Taking an average of Rs. 2-8-0 per ton overall, an income of Rs. 8½ lakhs per year on the above tonnage may be expected. Expenditure is more difficult to estimate accurately because of the various items of special repairs and replacements and the extent to which these should be met by a special *ad hoc* non-recurring grant to give the Port a new start.



Assuming that a non-recurring grant of Rs. 20 lakhs is made for special repairs, replacement and urgent capital works (detailed later in this note), the annual revenue expenditure on working the Port would be about Rs. 9.0 lakhs. This does not include :—

- (i) Interest on Capital outlay :
- (ii) Depreciation on wasting assets :
- (iii) Expenditure on the town of Okha which should be met by the Administrative authority of Okha Mandal area :
- (iv) Expenditure on railway lines which may be taken over by the Saurashtra railways as in the case of other ports of Saurashtra.

Essential works of a capital or special nature are detailed below. It has been worked out in two stages, the first one indicating the essential requirements for maintaining the present capacity of the Port and maintaining the existing works and equipments at working efficiency and the second one indicating the lines on which developments on a modest scale may be undertaken to increase the capacity of the Port as and when financial and other conditions permit. The former, *i.e.*, the first stage includes a measure for improving country craft traffic from and to Okha.

The immediate requirements are :

- (i) Dredging of the approach channel, mooring basin and the berths and surroundings.

Due to accumulation of silt over a number of years, there has been loss of depth at the channel and mooring basin. Sand is also drifting from behind the pier and if not arrested or removed, may soon foul the only deep water berth available. The dredger "Rukmavati" at Kandla can deal with bulk of the work *i.e.*, up to 22 ft. depth, but another dredger with capacity to dredge up to 30 ft. would have to be borrowed from Bhavanagar or other major port for dredging to final depths. The cost of this dredging chargeable to revenue is very roughly estimated at Rs. 6.0 lakhs. This does not include purchase of Grab dredger and hopper barges at a cost of Rs. 4.0 lakhs.

(ii) *Repairs to pier.*—The R. C. concrete pier requires strengthening, repairs, gunniting, fenders etc. The railway tracks require lifting and relaying. The sites for the new cranes have also to be strengthened. A sum of Rs. 80,000 would be required for this. Being a slow work, it would be spread over a number of years.

(iii) *Electric power supply.*—The present supply is not adequate for the needs of the port, town and railway workshop (wagon assembly). A new set of two 150 KW generators may be installed. The late Baroda Government had thought of one 600 KW and two 325 KW sets. The net cost after giving credit for return value of existing plant is taken at Rs. 1 lakh.

(iv) *Water supply.*—Okha Port and town are very deficient in water supply and the needs of shipping have also to be met. The port's share of expenses of augmenting the supply is estimated at Rs. 1.25 lakhs.

(v) *Cranes.*—The two existing steam cranes on the pier are obsolete and have to be replaced. While replacing, it is suggested that the capacity of each may be increased to 3 tons. The pier is not strong enough to take travelling cranes. The net cost of two fixed 3-ton portal cranes deducting the return value of the existing ones is taken at Rs. 2,50,000. One 2-ton meter gauge

travelling steam crane at a cost of Rs. 50,000 is also necessary. The cost of special repairs and replacements to other existing cranes may be taken at another Rs. 50,000 bringing the total under item "Cranes" to Rs. 3,50,000.

(vi) *Workshop equipment.*—With a large number of items of mechanical equipment and floating craft, the repair workshop has to be improved. Drilling, Shearing, and punching machines, lathes and a portable compressor are some of the items required. A sum of Rs. 50,000 may be allotted for this purpose.

(vii) *Replacement and augmentation of lighters and barges for movement of cargo from shore to ships at moorings and anchorages.*—There are 12 steel barges each of 100-ton capacity but some of them require heavy repairs or replacement. The fleet also needs augmenting. Three steel barges of 100-ton capacity are now on order and will be delivered by the end of 1951. Three more steel barges of 100-ton capacity (Rs. 2 lakhs) and 6 timber lighters of 50-ton capacity (Rs. 75,000) have to be ordered immediately. When all the above are received and such of the barges as can be repaired easily are repaired, the total carrying capacity will be about 1,500 tons which is necessary for the trade offering.

(viii) *Construction of a wharf wall for lighters and country craft.*—As there is only one pier, ships have to be worked at the moorings. The existing wharf can only be worked at high tides and a considerable amount of time is wasted. The Bombay Government have already purchased steel sheet piles at a cost of Rs. 3 lakhs. With an additional capital outlay of Rs. 5 lakhs, a wharf wall can be constructed a little ahead and seaside of the existing wharf. The berth at the lighter wharf should be dredged by a grab dredger (see Item 1) to such a depth that lighters and barges can be worked at all states of tide. The development of the lighter wharf is also necessary from the point of view of sailing craft. These have no facilities at Okha at present and have to stay away from and carry on cargo handling with difficulty.

(ix) *Miscellaneous items such as Roads, buildings, lights etc.*—Rs. 1,20,000. Summarising, the capital works and equipment, special repairs and replacements that are required almost immediately are :—

|  | Rs.              |
|--|------------------|
| (1) Dredging equipment . . . . .                       | 4,00,000         |
| (2) Repairs and strengthening of R.C.C. pier . . . . . | 80,000           |
| (3) Electric Power supply . . . . .                    | 1,00,000         |
| (4) Water supply . . . . .                             | 1,25,000         |
| (5) Cranes . . . . .                                   | 3,50,000         |
| (6) Workshop equipment . . . . .                       | 50,000           |
| (7) Lighters and Barges . . . . .                      | 2,75,000         |
| (8) Wharf for lighters . . . . .                       | 5,00,000         |
| (9) Miscellaneous items . . . . .                      | 1,20,000         |
| <b>TOTAL . . . . .</b>                                 | <b>20,00,000</b> |

*Note.*—(a) Does not include dredging cost of Rs. 6 lakhs which is a revenue charge.  
(b) Item (8) does not include cost of steel piles already at Okha.

It will be seen that no additional outlay is proposed against railway sidings and railway rolling stock, i.e., wagons, engines etc. The intention is that the present rolling stock may be used for what they are worth after minor repairs. The responsibility for providing rolling stock in the future will be on the

Saurashtra Railway as at other ports. No doubt there will be some difficulty in the immediate future on account of shortage of wagons but it is only a temporary phase and with the improvement of the overall wagon position on the meter gauge section of the Indian Railways, the wagons problems at ports would also be solved.

With regard to storage accommodation, it is felt that the port has enough covered sheds owned by itself. Future policy should be to encourage construction of private godowns and to this end, land may be leased by the Port on easy terms to parties intending to construct sheds. Cement is one of the regular items of export and there is no reason why the cement concern should not be persuaded to construct its own godown.

With regard to the second or development stage, the works required will be :—

|   | Rs.       |
|---|-----------|
| (a) One more deep water pier at a cost of . . . . . | 30,00,000 |
| (b) Launch and floating equipment . . . . .         | 1,00,000  |
| (c) Cranes . . . . .                                | 5,00,000  |
| (d) Staff quarters and amenities . . . . .          | 2,00,000  |
| (e) Water supply . . . . .                          | 2,00,000  |
| (f) Dredger . . . . .                               | 25,00,000 |
|   | <hr/>     |
| TOTAL . . . . .                                     | 65,00,000 |
|   | <hr/>     |

An additional traffic of 2½ lakhs of tons will be necessary to justify this expenditure—unlikely to be achieved.

## V. SAURASHTRA STATE

The five important Ports of Saurashtra are all well equipped with lighters and tugs and have plenty of storage accommodation served by railway sidings and marshalling yards. In this respect they differ from the minor ports in other parts of India. Even the busiest port of Madras, say Tuticorin is not as well served in these respects as the smallest of the Saurashtra minor ports. There is at present a severe shortage of railway wagons but is hoped that this will be got over as soon as the overall shortage of wagons in India on the meter gauge section is remedied. A pool of dredgers and tugs has been suggested for Saurashtra. A number of minor works and improvements are suggested against individual ports noted below :

### (a) BHAVNAGAR

This is the most developed port of Saurashtra. Notwithstanding enormous natural disadvantages, the late State of Bhavnagar had gone on with the development of this Port and built up a trade which now stands between 3,00,000 and 4,00,000 tons per year.

Soon after visiting this Port, it became clear to me that the problems at this Port cannot be resolved by a short visit. The late Bhavnagar State Government and the present Saurashtra Government have consulted several eminent Engineers and experts on the question of siltation in the Gulf of Cambay and the Port of Bhavnagar and the problem of dredging and maintaining a deep water basin at the latter place. Many of the recommendations of these experts are divergent if not contradictory. The Port has a number

of dredgers but for one reason or other, the total output of these dredgers has not been adequate to check the further siltation and make any substantial improvement in the waterways. The recommendations of the West Coast Major Port Development Committee that steps must be taken to obtain at least 28 ft. of water at the berths has not been possible of fulfilment till now.

The State Government has not been able to take final decisions as no clear cut case has been presented. Important issues affecting the future of Bhavnagar as a deep sea port are involved. Difficult though the problem of dredging and maintaining deep water berths is, it can be tackled but the deterioration of the Gulf of Cambay and the approach to the Bhavnagar Port are more serious and attention should be focussed on them. Professor Tysee's report on these points is still awaited.

Within the short time at my disposal, I could only form an idea of the magnitude of the problem and the issues at stake. A close observation on the spot along the approach channel and the anchorage at different states of tide and a study of the various technical reports are necessary before any final recommendation can be made.

It is, however, obvious that no heavy expenditure should be incurred at Bhavnagar until the dredging problem is solved and the future of Bhavnagar as a deep sea port is decided. Meanwhile the existing dredgers should be worked to their full capacity. The provision of facilities for sailing craft and lighters at the steel jetty need not, however, be held up as such facilities are necessary in any case.

Certain organisational changes to ensure the maximum use of the dredgers such as the stationing of the Mechanical Engineer at the spot instead of employing him in a more or less administrative capacity at Rajkot should also be carried out. The present Port Officer who is very experienced in dredging matters should also be relieved temporarily of some of his routine duties by giving him an Assistant Port Officer to enable him to devote more of his time to the dredgers and dredging. The purchase of an Echo Sounder would be very helpful for periodical surveys.

The feasibility of reducing dredging by impounding tidal water in a basin and scouring the approach channel is open to grave doubts. A contour survey of the area and the quantitative determination of the volume of water required to scour the channel and the possible consequential effects in the Gulf of Cambay in and near the Anchorage have to be systematically studied before an opinion can be given. Scour channels require training works to focus the stream of water. The cost of forming a basin with gates and training works may not be justified if the Gulf of Cambay continues to silt up due to more malevolent forces of nature tending to encroach on the Bhavnagar channel from the Malcolim channel side and which cannot be scoured by the above basin. Moreover high velocities required for scouring channel beds are unsafe for navigational purposes which means that time and tide favourable for working at the Port may be further reduced by the need for time to scour out the channel daily.

Enough has been said to show the complexity of the problem. The available data should now be studied and correlated and specific recommendations based on such studies and observations made.

## (b) VERAWAL

This is an open roadstead on the south-west coast of Kathiawar. Wharves and a sheltered basin for sailing craft and lighters are available. The entrance is protected by a breakwater on the north. Ample railway facilities and godown accommodation are available.

The late Junagadh State was anxious to develop a deep sea harbour at Verawal at a cost of about Rs. 2½ crores but it is doubtful if it would have been a success from the financial and trade points of view. The West Coast Major Port Development Committee had no hesitation in rejecting Verawal as a possible site for a major port.

No important engineering works are necessary for the present. The Dipper Dredger "Zabardust" which is very old needs replating. Hopper barges to work with the dredger are also old and heavy repairs are necessary. Two more 100-ton hopper barges and one Grab Dredger should be purchased between Verawal and Porbunder Ports.

The sanitation at Verawal Port is very bad and needs immediate attention. Some of the open transit sheds may be converted into godowns by building up or sheeting the sides. Verawal is noted for boat repairing and building and lighters from nearby ports take shelter at Verawal during the Monsoon.

Precautions against fire, isolation of petrol and kerosine godowns, improvement of water supply and electric lighting are some of the other items that need early attention.

The approaches to Verawal Port from the anchorage to the inner harbour and the inner harbour itself need to be surveyed and buoyed and the depths and position of buoys checked periodically.

The tugs, lighters and barges for traffic purposes appear to be adequate provided they are kept up in good working condition. This throws a heavy burden on the workshop and repair staff during the four non-working monsoon months. The workshop also needs strengthening by the addition of lathes, shaping and shearing machines and one air compressor.

## (c) PORBUNDER

This is an open roadstead on the West Coast of Saurashtra used by sailing craft and lighters only. The anchorage is about 2 miles off shore. There is a rock bar with hardly 2 ft. water at low tides. A scheme for lowering the rock level at the bar has been sanctioned at an estimated cost of about Rs. 4 lakhs. This work is in hand. The method adopted is to drill holes in the rock by hand drills worked by compressed air plant ; to charge them with gelignite and explode same electrically. The work can only be carried out in low tide and mid-tide. Hence it is necessarily slow. The shattered stones are removed by the dipper dredger. Although the dredger at Porbunder has been provided with spuds and rock cutting chisel and was intended to be used for rock cutting, it is not now advisable to use it for such work as the hull which is of timber construction is too weak to stand the vibration and shock.

There are some misgivings felt by some that the channel cut in rock will soon be filled by sand due to wave action. There is no indication of this appening but in any case it would be desirable to observe the soundings on

either side of the deepened channel periodically. The works required at Porbunder are :—

- (i) The completion of rock cutting in bar. At present the lighters and sailing craft enter or leave only at high tides. Every foot of lowering the rock increases the number of working hours.
- (ii) Repairs to wharf walls wherever damaged.
- (iii) Dredging in the inner harbour or channel. This requires a grab dredger and hopper barges.
- (iv) Provision of customs wall in place of fencing.
- (v) One storage godown with a floor area of about 5,000 sq. ft.
- (vi) Provision of a tug of about 150 H. P. and a Grab dredger and 2 hopper barges. (The last two items in common with Verawal).
- (vii) Increase of lighter fleet by at least 200 tons cargo capacity. This is necessary for salt export.
- (viii) Providing a strong steel hull to the dipper dredger.
- (ix) Starting of a small repair workshop at the Port.

(d) BEDI

This is a very well equipped lightering port on the south side of the Gulf of Kutch. The boat basin where loading and unloading of cargo is carried out is about 7 miles from the sea anchorage. The long approach is shallow and movement of tugs, barges and sailing craft is not possible during low tide hours. This has placed a great handicap on the Port. The Port authorities have in the past sought to improve the trade position by increasing the fleet so that as large a tonnage as can be handled by the ships side in one tide may be available there. In the boat basin itself all the water drains off and leaves the bed dry. Boats, barges and launches rest on this bed during such low tide periods which is not very good for the barges and tugs especially steel ones. Not only is the protective coat of paint liable to be rubbed off at each tide but structural members would be subjected to undue stresses. Some dredging in the basin by manual labour is in progress but as the whole area of the basin needs cutting 4 to 5 ft. in order to provide enough water to keep the craft always afloat, the employment of a grab dredger for 3 or 4 months is necessary. The same grab dredger can also dredge bad patches in the approach between the sea anchorage and the basin. To the extent that the approach channel is deepened the working hours of the Port craft will increase. The deepening of the whole of the 7 mile channel to such depths as to be able to work at all states of tide would be a very costly proposition. What is now suggested is to survey the approaches and remove the worst patches. The basin should, however, be deepened to the extent that the foundations of the adjacent wharf walls permit.

As will be seen from Appendix the plant and craft and mechanical equipment at this Port is very heavy. There is need for adding a fleet of lighters or barges and increase the capacity by at least another 300 tons. When a salt ship is in port, the shortage is keenly felt. The maintenance and upkeep of many of the items of plant and craft is lagging behind. A number of items of plant not ideally suited for the work such as sea mules have been purchased from War surplus stocks. Many of the tugs and launches have also become old and need constant repairs and attention. The workshop should be remodelled and properly manned to cope with the heavy work.

As a policy it is suggested that ports should go in for timber lighters of 40/50 ton capacity in preference to steel barges of 100 ton capacity or more whenever it is proposed to increase the tonnage of such fleet. The advantages which new steel barges of large tonnage have over a larger number of smaller timber units are not overlooked but timber lighters have the following advantages.—

- (i) Easy maintenance—The tindels and khallasies themselves look after the lighters.
- (ii) There is no need for attention to these at work-shops or dry docks. The strain on repair shops would be reduced.
- (iii) Reduces the demand on steel which is scarce and utilises timber.
- (iv) Longer life of timber boats.
- (v) Encourages boat building industry and gives employment to local labour.

Bedi Port has enough storage accommodation but more would be required for storing cement if Sika Port is not developed. All the cranes need overhauling and in several cases, the boilers have to be changed.

Summarising, the immediate requirements of Bedi Port are :—

- (i) A grab dredger and 2 hopper barges ;
- (ii) Dredging the basin and parts of the approach ;
- (iii) Overhaul of cranes and replacement of boilers where necessary ;
- (iv) Re-organisation and improvement of workshop ;
- (v) Addition of lighters of a tonnage of about 300 ;
- (vi) A powerful tug in lieu of a number of weak tugs.

#### (e) SIKA

This is another port in the Gulf of Kutch, 12 miles from Bedi and connected by the Saurashtra Railways. There is deep water in a sheltered channel. Sika was considered several times for construction of a major port but although marine conditions were favourable, there were other factors which weighed against the selection of the place as a site for locating a deep water major port.

The present port of Sika is used more or less solely for the export of cement from the Sika Cement factory. A salt factory may come into existence in due course. There are no port facilities provided except what has been provided by the cement works, *viz.*, a long narrow gauge track jetting into the foreshore and submerged by tidal waters at each tide. Z craft and LCT stand by the side of this track and loading takes place from trucks direct to these craft. These craft sit on the bed of the slopes waiting for the next tide to float and move.

It is feasible to cut a channel for the craft and lay a bund for carrying the track clear of tidal levels and if necessary build a boat basin with gates which can be closed against receding tides. All these will cost Rs. 3 to 4 lakhs. Financial justification is lacking as only cement export is expected and the prospects of other trade following are remote. The best policy at Sika appears to be to let the cement factory develop the Port at its own cost and show some rebate in shipping dues as an encouragement for a period of 20 years or so.

Sika would perhaps be a very useful Port from the Naval point of view and might be further examined from that angle.

## (f) NAVALAKHI

Navalakhi is one of the finest lighterage ports in India. The anchorage is only  $1\frac{1}{2}$  miles from shore and although there are two bars in the approach channel they are sufficiently deep to permit of lighters and tugs moving at all states of tide. By reason of its geographical position in relation to upper Gujerat and Central India, the port commands a good hinterland.

The port has developed on two sides—the Sui side and the Barsamedi side. The latter has a deep water berth and steel pile wharf fitted with cranes.

The former is used for inflammable articles, coal and sailing crafts. The jetties on the Sui side are constructed of timber and are decaying. Their repairs and replacements are urgently necessary.

One exclusive jetty for handling petrol and kerosene and a separate godown near that jetty are necessary. This will set free some more space for railway coal. The new jetty should be located as far east in the Sui side as depth of water in channel permits.

Ample storage accommodation well served by railway lines exists. Navalakhi is a purely Port town and every amenity has therefore to be afforded by the Port authority. Water supply should be improved and one overhead tank for storage is necessary. With regard to electric power supply for lighting and running the workshop, the existing generators are insufficient and at least two 100 KW generators are necessary. The existing smaller units may be taken away for use elsewhere.

Salt production is a thriving industry at Lavanpur nearby. Facilities for export of salt are, however, meagre. The creek is 4 to 5 miles long and is shallow near the salt jetties. Sounding of this creek and dredging near the jetties are necessary. There is also shortage of room for turning the craft at the salt loading jetties. Some hand dredging is being done at present. Elsewhere I have recommended the purchase of a grab dredger for the combined use at Bedi and Navalakhi. When this is available, the improvement of the creek may also be undertaken. Grab dredging is also necessary at the jetties on the Sui side. Strict control over the creeks and over the cutting of mangroves is necessary to save soil erosion and siltation.

Navalakhi is used to a large extent as a distributing centre for foodgrains. Railway coal is also imported regularly. Salt is the only important item of export.

The strength of fleet of tugs and barges is adequate for the needs of general cargo but when ships taking salt call at the Port along with any other ship, salt export suffers. Either another 6 timber lighters of 50-ton capacity each should be provided by the Port or the salt factory agents permitted to own and ply their own lighters, supplemented when necessary by departmental lighters. Similarly, there is need for one lighter tug exclusively for salt exports but the necessity is felt only when ships bunch and not always.

The workshop at Navalakhi needs organising and improvement. Summarising, the immediate requirements of Navalkahi Port are :—

- (i) The dredging near jetties and spaces between jetties on the Sui side and in the salt creek on the Barsmedi side after taking soundings.
- (ii) Repairs to timber jetties and replacements where necessary.
- (iii) The construction of a new jetty and new godown for the handling and storage of mineral oils.



- (iv) Improvement of water supply and provision of an overhead tank.
- (v) Installation of new generators for increasing power supply.
- (vi) Reorganisation and improvement of workshop.
- (vii) Increase of lighter fleet by another 300 tons.

#### (g) JAFFARABAD

This place could not be visited but as it is a place of growing importance and in view of the possibilities of the place as a port, it is mentioned here. Jaffarabad is on the south side of Kathiawar on the Gulf of Cambay but it does not suffer from the serious troubles such as siltation, common to Gulf ports. Indeed it may be a good site for an important minor port. About 36,000 to 40,000 tons of salt are despatched from Jaffarabad every year and this may even increase. There is a flourishing fishing industry. The place is not connected by railway. The extension of the railway from Rajula to Jaffarabad—a distance of 12 miles has been recommended elsewhere in this note.

A wide basin surrounded by hills is available. Borings may be taken to see if rock exists in shallow depths. When this information becomes available, a scheme with estimates of costs could be drawn up for the development of the Port for lighter cargo and passengers.

### VI. KUTCH STATE

#### (a) GENERAL

The State of Kutch is still undeveloped and Port development has almost to start from nothing except at Mandvi. Detailed attention to its problems had therefore to be paid. The Port of Kandla which was the most important Port of Kutch is now being developed as a Major Port and administered by the Central Government.

One peculiar feature of Kutch to which reference has already been made in Part I of the report is its noticeable lack of internal communications—Roads, Railways, Telephones and Telegraphs. Sea communication along the coast with a number of minor ports suitably placed along the coast line is a necessity to serve as distributing and collecting centres. The life of the community depends to a great extent on this means of communication with other parts of Kutch and the rest of India.

Construction and running of Ports in Kutch should therefore be regarded as one of the primary necessities and not too meticulously examined from the point of view of return on Capital, though there is no doubt that an adequate return will also be forthcoming in due course.

There are two important Ports in the Gulf of Kutch—Mundra and Mandvi. These serve the richer and more prosperous parts of Kutch. The Port of Tuna is not mentioned as it is more or less a sub Port of Kandla. The Port of Jakhau is on the Arabian Sea—not on the open sea but in the Godia creek. The Ports of Koteswar and Lakhpat are in the Khori Creek.

The importance of the Ports of Mundra, Jakhau and Koteswar depend upon the huge Salt works proposed at each of these places. The scope for the manufacture of fine quality Salt and of establishing bye-products industry is very great. The State has only to provide Port facilities for their despatch. In the course of inspection of Kutch Ports, two other places were inspected.

The first is Medi about 30 miles north of Jakchau. This provides a sheltered landing ground for Naval craft and was so used in the last war. There is, however, no road to this place.

The second is Madva about 8 miles from Mandvi. This is on a creek and is free from siltation troubles as at Mandvi. There is scope for locating a salt factory at Madva and if it develops, a port may be opened at Madva with one or two jetties. Madva could also provide a sheltered place for laying up craft from Mandvi during the rough monsoon season. These might be developed in future as and when necessity arises.

Administrative and financial matters have been reported on in Part I. The Minor Port Fund for Kutch when formed would be self-supporting. The position will improve further when the Salt Factories go into production. According to most conservative estimates, the export of Salt will reach 80,000 tons per annum in 3 years and about 200,000 tons in 6 years.

The Port Dues and Landing and Shipping dues are now credited to a single General account. This may continue. There is no scope for immediate increase of rates.

A passenger levy of one anna per adult may be levied immediately. This may be increased to two annas per head after further facilities are provided at Mandvi.

Landing and shipping dues should continue to be charged on tonnage basis and not *ad valorem*. A system of licensing local pilots should be introduced at Mandvi and pilotage fees charged.

Licenses of craft should be subject to renewal every year and not only once at registration as at present. The Bombay coasting vessels Act should be adopted with modifications at Kutch.

A comprehensive Port Manual comprising all the rules, regulations and local rulings, rates etc., should be drawn up. The Kutch Port rules and Minor Ports (Regulation and management) Rules will it is presumed be notified soon on the lines of the drafts already published in the Gazette of India.

Telephone and Telegraph Communication should be established at all Port towns with the State Capital.

Roads are in a very primitive stage and should be improved. The northern area may be prospected for establishment of a Cement factory.

Tide readings should be taken at each Port for at least one year. Marine Survey of stream or creek at least 500' on either side of site of proposed jetties should be put in hand immediately. Standard reference Bench Marks should be established at each port. The datum to be adopted should be the same as that adopted by the Kandla Port.

Land and Property Plans and Registers should be prepared for each Port and Port limit and land boundary pillars erected.

#### (b) PLANT AND EQUIPMENT

The immediate requirements are given below :—

|                             | Estimated<br>cost<br>Rs. |
|-----------------------------|--------------------------|
| (i) Tug 100 H. P.—1         | 1,50,000                 |
| (ii) Outboard Motor Boats—2 | 2,500                    |

|   |              |
|---|--------------|
| (iii) Lighters, wooden 40/50 ton capacity—10 . . . . .  | 2,50,000     |
| (iv) Survey, drawing and mathematical instruments, Marine Survey equipment, Sextants, Binoculars etc. . . . . | 5,000        |
| (v) Workshop equipment :—   |              |
| Lathes—2 . . . . .  | 50,000       |
| Drilling Machine . . . . .  |              |
| Punching and Shaping machines . . . . .   |              |
| Welding Plant . . . . .   |              |
| Fitters and Carpenters Benches . . . . .  |              |
| Circular or Band Saw . . . . .  |              |
| Building . . . . .  |              |
| Total   | Rs. 4,57,000 |

Additional Tug, Lighters, Launches, Workshop Equipment etc., may be added as and when the need arises.

### (c) ORGANISATION

The headquarters staff at Bhuj to consist of the following under the Port Commissioner and Harbour Engineer.

#### Office Staff :—

One Accountant  
One General Clerk  
One Typist/Clerk  
Two Peons

#### Technical Staff :—

- (i) at Bhuj . . . . . One overseer  
One Estimator/Draftsman
- (ii) at Mandvi . . . . . One overseer  
One Mechanic

*Note.*—One temporary additional workcharged Overseer may be appointed for the northern group of Ports, viz., Lakhpatt, Koteswar and Jakhau till construction works are completed. He has to take up surveys now.

With regard to detailed working of each of the Ports, the Ports should be run by the Port Organisation by its own Port Conservators and Central Customs should be relieved of this responsibility. This need not, however, be carried out immediately till the works suggested at the northern ports are completed and the salt factories go into production. The ultimate organisation may be as follows :

- At Mandvi . . . . . One Port Conservator—Class A (Same grade as Overseer).  
One Clerk.  
Two Khallasies.
- At each of the other Ports . . . . . One Port Conservator—Class B (Rs. 55—3—85—4—125—5—130).  
One Khallasi.

#### NOTES.

- (a) No change is suggested in Lighthouse staff. Workshop staff for the workshop to be located at Mandvi will depend on the machines provided.

(b) Survey of craft for licensing etc. can be done by part-time staff borrowed from Kandla and a fee paid. Full time surveyor is not justified.

(c) The pay and status of the Port Commissioner and Harbour Engineer should be raised and he should have a jeep at his disposal. His headquarters may continue at Bhuj now but may be shifted to Mandvi when dredging and river works are taken up.

(d) The maximum of the scale of pay of clerks should be raised to Rs. 130 to correspond with the Central scales of pay.

(e) All staff except in Bhuj and Mandvi should be provided with quarters near to Port. All operating staff should have distinctive uniforms provided.

#### (d) INDIVIDUAL PORTS

##### (i) LAKPHAT

This Port is of no commercial importance except as a distributing centre for the northernmost areas. Being rich in some minerals such as Gypsum, an export trade may develop. This is the nearest port to the south side of the Great Rann of Kutch. Chief disadvantage is its great distance from any busy or developed town. There is no port facility at present. Approximate figures of outlay required is given below :

|  | Present<br>Rs. | Future<br>(Additional)<br>Rs. |
|--|----------------|-------------------------------|
| R. C. Jetty . . . . .                          | 1,20,000       | ...                           |
| Reclamation . . . . .                          | 20,000         | 10,000                        |
| Road . . . . .                                 | 30,000         | 50,000                        |
| Godown 50' x 30' . . . . .                     | ...            | 15,000                        |
| Open stacking ground (raised plinth) . . . . . | 10,000         | 10,000                        |
| Office . . . . .                               | 6,000          | 4,000                         |
| Quarters . . . . .                             | ...            | 20,000                        |
|  | <hr/> 1,86,000 | <hr/> 1,09,000                |

##### (ii) KOTESWAR

This place is nearer to the Arabian Sea and has been in use for a long time by small country boats. The current in the Khori Creek is strong (about 5 knots) at this place. The old stone boulder groyne and landing place has been damaged and siltation taking place. A big salt factory is being contemplated at this place. 30 to 40 thousand tons of salt export per year which could easily be expected at this place would provide a full justification for the works noted below.

|                                    | Present<br>Rs. | Future<br>(additional)<br>Rs. |
|------------------------------------|----------------|-------------------------------|
| Timber Jetty . . . . .             | 1,00,000       | ...                           |
| Reclamation . . . . .              | 30,000         | ...                           |
| Road . . . . .                     | 25,000         | 15,000                        |
| Storage godown 50' x 30' . . . . . | 15,000         | ...                           |
| Office . . . . .                   | 6,000          | 5,000                         |
| Quarters . . . . .                 | ...            | 20,000                        |
|                                    | <hr/> 1,76,000 | <hr/> 40,000                  |

The jetties may be of the same type and size as now at Mundra. If Koteswar has to develop, a powerful tug is also necessary as the distance from the ships' anchorage would be very great for dumb lighters alone to negotiate.

### (iii) JAKHAU

This promises to be one of the most important minor ports in Kutch chiefly on account of the Salt export expected as soon as the salt works are completed. The factory is expected to be one of the biggest in India.

The old landing place in the main Godia Creek having silted and proved unsuitable for lighters, it has been abandoned for all but timber cargo and a new landing place declared open temporarily till a final site is selected. This temporary site is one mile inside of a branch creek with calm waters and is nearer to the town of Jakchau.

The new site selected for the final location of the Port for the salt as well as general cargo is at a place called Bhit at the junction of the main Godia Creek and the branch creek. The tidal current here appears to be strong—4 knots—and may be worse in very high or low tides. Cross sections and current and tide observations should be taken before finally accepting the site.

From the point of view of purely general cargo trade, the present temporary site is equally suitable and involves less of road construction. But the site would be unusable for salt trade and a separate landing and shipping place for salt would be necessary. Thus the alternatives are :

(a) to have both the general and salt jetties at the same place, *i.e.*, Bhit in Godia Creek.

or

(b) to have the salt jetty at the above place and a general cargo jetty at the present landing place in the branch creek.

The former is preferable if the physical conditions such as currents permit. Data should therefore be collected. If the latter alternative is chosen, the Salt factory owners may be permitted to put up their own jetty and access road at their own cost.

The works required at Jakchau are noted below :

|                                    | Present        | Future<br>(additional) |
|------------------------------------|----------------|------------------------|
|                                    | Rs.            | Rs.                    |
| Timber jetty . . . . .             | 1,00,000       | ..                     |
| Reclamation . . . . .              | 30,000         | ...                    |
| Road . . . . .                     | 80,000         | 60,000                 |
| Storage godown 50' x 30' . . . . . | ...            | 15,000                 |
| Office . . . . .                   | 6,000          | 5,000                  |
| Water supply . . . . .             | 4,000          | ...                    |
| Quarters . . . . .                 | ...            | 20,000                 |
|                                    | <hr/> 2,20,000 | <hr/> 1,00,000         |

There is a necessity for a lighthouse or a beacon light at a convenient place near the mouth of the Godia Creek.

#### (iv) MUNDRA

This port is in the Gulf of Kutch alongside the Bocha Creek. The old port about  $1\frac{1}{2}$  miles away has silted up and is unusable except for landing timber which has to be left on the slopes. A good timber jetty has been put up at the new site. Earth work for a road connecting the new site to the town of Mundra has been carried out but it has to be surfaced and a long causeway constructed. Without the road, the port cannot be used.

Mundra serves a comparatively prosperous hinterland of Kutch. A big salt factory is about to be opened in an area immediately adjacent to the new Port site. The salt factory which would be the main user of the new road to the jetty for sometime to come should contribute towards the cost of the road. Mundra Port would be a paying port as soon as salt export commences. Any outlay there would be fully justified financially.

In leasing land for salt works, sufficient area should be reserved for Port purposes.

It is unfortunate that a large part of the expenses on ports in Kutch consists of expenditure on approach roads. This is due to the backward state of road development in general in this area.

The works required at Mundra are given below :

|                                    | Present        | Future<br>(additional) |
|------------------------------------|----------------|------------------------|
|                                    | Rs.            | Rs.                    |
| Storage godown 50' x 30' . . . . . | 15,000         | ...                    |
| Office . . . . .                   | 6,000          | 4,000                  |
| Road . . . . .                     | 1,50,000       | ...                    |
| Water supply . . . . .             | 4,000          | ...                    |
| Quarters . . . . .                 | ...            | 20,000                 |
|                                    | <hr/> 1,75,000 | <hr/> 24,000           |

*Miscellaneous.*—The above four ports of Lakpat, Koteswar, Jakhau, and Mundra are alongside creeks and have practically no siltation or dredging problems. Full control should at all times be retained by the Port over the conservancy of the creeks and no private agencies should be allowed to interfere with the Creeks such as bunding, diverting, pumping etc. Any such work might upset the natural regime and cause serious siltation or scours at places.

The cutting of Mangroves alongside shores of creeks and backwaters should be prohibited atleast for 100 yards from the water edge. Mangroves protect the land from erosion and consequently creeks from siltation and nothing should be done to remove this natural protection.

#### (v) MANDVI

The maintenance of waterways at Mandvi presents problems which are common to Ports situated at river mouths. Mandvi is situated at the mouth of the river Rukmavati where it debouches into the Gulf of Kutch. The anchorage is about 2 miles from the coast line.

A wharf wall was first constructed alongside the west bank of the river and boats up to 100 tons capacity berth there for loading and unloading operations. In order to provide calm water at the berths and to keep off sea sand from creeping into the wharf area, a break-water 1850 ft. in length was constructed. This breakwater which is a very solid construction consists of cylindrical monolith concrete blocks. This has served its purpose to a large extent although like all such constructions jetting into the sea, the accretion of sand has soon overtaken and the breakwater needs further extension.

The river Rukmavati is the biggest river in Kutch. It has a total catchment of about 143 sq. miles but considering the scanty rainfall of Kutch, the size and discharge of the river are small. The maximum flood discharge has been calculated at 1,03,000 cusecs. It appears that in the past, the river was able to scour and maintain sufficient depth in a narrow channel through the bar between the wharf and the open sea. With the construction of some irrigation dams and reservoirs, chiefly the Vijaysagar Dam, the flow in the river down stream of the Dams is so scanty that it has no scouring capacity. Silting at the bar and the creep of sand into the inner bar has therefore increased. The triangle formed between the south return end of the wharf and the north end of the breakwater is also rapidly silting.

To add to these difficulties, the east bank of the river down stream of the road bridge is scouring during each flood discharge and the scoured material deposited into the river mouth basin and forming islands and shallow mounds making navigation difficult and dangerous. Groynes and pitching for the protection of the north bank have been contemplated on a minor scale after the recent damage in 1948-49 floods.

A still further difficulty experienced at Mandvi is the enormous quantity of wind borne sand. Enormous sand dunes are formed for miles and miles on either side of Mandvi along the coast. The sand is usually blown from west to east and there is no doubt that a considerable quantity finds its place into the river. Some of the houses near the coast at Mandvi are partially buried in sand and it is with great effort and expense that the public are able to clear the sand. Its effect on the health of the citizens is also very detrimental.

The problems facing Mandvi are thus of some considerable magnitude. Engineers who have reported on this Port in the past have drawn attention to the difficulties of combating sand accretion from the sea and the deposition of silt by the river. The unsuitability of Mandvi for development into a big port has been stressed by Engineers in the past. With this opinion, I fully agree.

The river which has now become feebler cannot be counted upon for scouring and maintaining a channel wide and deep enough for country craft unless the flow is trained into narrow limits instead dissipating over a wide shallow bar.

The angle of approach in the past has, however, been to select the best port in Kutch for development. The present approach is to see that Mandvi retains its present capacity and is maintained sufficiently well as a good minor port for country craft and passenger traffic. For this purpose it is sufficient to maintain about 8 ft. water at mean tide at the wharf and approaches. This can be achieved at comparatively small cost.

The initial works required for this purpose are :

(a) river training works and protection of the east shore of the river ;

- (b) initial dredging through the bar and in the inner harbour to remove the accumulation of several years;
- (c) extension of the breakwater by about 200 ft.

The object of the first item is to prevent scour of the north bank and to keep the stream more to the west bank. The pitching on the slopes of the bank needs no special instructions. Five groynes projecting about 200 ft./300 ft. into the river bed and at an angle of  $45^{\circ}$  to the shore and spaced at intervals of 600 ft. may be constructed. The groynes nearer to the road bridge will be 200 ft. long and those nearer the sea 300 ft. long.

The groynes may consist of two rows 8" to 10" dia. wooden bullies driven at least 10 ft. into the bed. The bullies are to be connected by cross members and the spaces between the rows filled up by stone boulders as heavy as can be handled by men without the use of mechanical appliances. The ends of the groynes should be specially strong to stand the force of water. After gaining experience for one or two years, the groynes may be extended, if necessary. An outline sketch is attached but detailed drawings should be prepared on the lines suggested before work is commenced.

With regard to dredging, only initial dredging to give a start should be carried out now and careful observation made of how the dredged channel behaves. The craft in view for dredging is the dredger "RUKMAVATI" now at Kandla. It is estimated that about 6 months' dredging in the calm season will be necessary and the cost of same including hire charges will be about Rs. 1 lakh. There is also need for grab dredging close to the wharf and in the lee of the breakwater.

The extension of the breakwater further into the sea is necessary but may be postponed to later years till the effects of the river training works are observed.

Although an accurate estimate of the works involved can only be prepared when the details are worked out, the expenditure is likely to be Rs. 4 lakhs for the river training works and Rs. 1 lakh for the initial dredging.

Other port facilities required are given below :

- (a) Godowns and open stacking places on raised plinth.
- (b) Passenger amenities.
- (c) Water supply.
- (d) Fencing, latrines.
- (e) Repair to existing breakwater.
- (f) Workshop and workshop equipment.
- (g) Cleaning of sand dunes for 100 ft. west of the Port and Customs office.
- (h) Provision of two hand cranes of 2-ton capacity each for lifting heavy weights from or to boats.

The aggregate total cost of the above would be about Rs. 75,000.

As a preventive for the formation of sand dunes close to Mandvi, it is suggested that the fetch of the wind should be broken by planting trees. The growth of creepers should be promoted. The Agricultural and Forest Departments may be consulted in the matter.



It may at first appear that the expenses of keeping Mandvi open are very high. A suggestion has also been made that the Port should be abandoned and a new site chosen. Such a drastic step is not necessary. Even in its present condition, Mandvi has been dealing with a traffic of the value of Rs. 2½ crores per year and nearly 3,000 country craft are visiting the place. The minimum works required to keep the port going should therefore be undertaken.

### CONCLUSION

Within the short time available, it was not possible to visit many other minor ports nor give more time to the ports visited. An overall picture of the ports of India as a whole including the former Maritime Princely States, with statistical details has been obtained.

The 18 intermediate ports would, if improved and modernised, be a valuable asset to the Transport economy of the country. The expenditure on dredgers is more or less inescapable, if the Ports are not to get gradually worse. Indeed a total outlay of Rs. 2½ crores on the minor Ports could not be considered excessive when the value of trade passing through them exceeds Rs. 100 crores per year.

S. NANJUNDIAH,

VIZAGAPATAM PORT ;

May 1951.

*Officer on Special Duty (Minor Ports).*



## APPENDIX

## NOTE BY MESSRS. THE BOMBAY STEAM NAVIGATION CO., LTD.

The steamer services maintained by the Company on the Konkan Coast have been the main source of communication between Bombay and the ports in this Coast for over three quarters of a century. About a million passengers take advantage of these services annually. Passengers on this coast prefer the sea route to any other route, whether it be by rail or rail-cum-bus or bus route, as this is the most convenient and cheaper mode of transport. The same remarks apply to passenger traffic between Bom bay/Mangalore and between Bombay and Cutch-Mandvi where also passengers prefer sea route to rail route.

The following two ports in the Harbour of Bombay have better prospects so far as the passenger traffic is concerned :—

(1) ELEPHANTA.—The Govt. of Bombay have a plan to convert this island into a week-end and holiday resort. There is an increase in the number of passengers visiting this island on Sundays and holidays. Many tourists and holiday-makers are attracted to this place owing to the ancient caves situated on the island as also owing to the natural scenery of the island.

(2) REWAS.—The Govt. of Bombay have under consideration certain plans to make Kolaba District a paradise for tourists. The Government have also recently announced their intention of developing some ports in the Bombay Harbour as “suburbs of Bombay”.

As Rewas is a very important port in the Harbour, through which considerable passenger traffic from places in the interior in Kolaba District passes, there is bound to be an increase in the passenger traffic to and from this port if the above schemes materialise.

There is, however, the difficulty due to stoppage of evening services between Bombay and Rewas from end May to early September every year, i.e., during the monsoon period, and sometimes even of the regular morning services—thus stopping up all connections altogether for 3/4 days even in the morning. The absence of afternoon and evening communications due no doubt to monsoon weather detracts from the value of Rewas as an ideal suburb of Bombay.

It is, however, necessary to carry out a number of improvements in the landing facilities and to provide amenities such as supply of drinking water, resting rooms, hotels etc., in order to attract passenger traffic to the above ports.

The greatest problem of the shipping companies is rapid siltation that takes place near the Pier at Rewas, and this should receive the urgent attention of the authorities concerned. There have been two extensions to the present jetty at Rewas due to siltation and even after the last extension the jetty is silted and our launches with shallow draft cannot go alongside this jetty at low tides.

(3) DHARAMTAR.—This is also an important port in Kolaba District at a distance of 21 miles from Bombay and 10 miles from Rewas, situated in Dharamtar Creek. This port serves the needs of a large number of transit passengers between Bombay and nearby places in Kolaba District up to Mahad who utilise the numerous bus services up to and from Dharamtar. In the monsoon period—June/August each year, the port handles similarly a very large in transit traffic between Bombay and destinations much further down south beyond Mahad—say up to Ratnagiri as the fair season coastal steamer

services are closed during the monsoon. The services to this port are only in the mornings both in fair weather and monsoon period.

Rapid siltation is taking place in Dharamtar Creek as will be observed from the following few details :—

- (1) In 1925 Padmavati type of steamers with a draught of 8 ft. used to go up to Dharamtar at *alltides* without any obstacles.
- (2) In 1939 it was found difficult for smaller launches with a draught of 4 1/2 to 5 ft. to proceed up to Dharamtar for about 4 days in a month on low tide days due to silting.
- (3) In 1945 the depth of water on Mankawala Bar (2 miles from Dharamtar) at dead low tide was said to be about 6 ft.
- (4) In 1949 the depth of water on the above bar at dead low tide was said to be about 4 ft.

Although Dharamtar is connected with more than 10 important traffic centres such as Pen, Nagothra, Roha, Mahad etc., in the interior of the Kolaba District, by means of bus services, it is likely to lose its importance as a Port owing to the rapid siltation taking place in the creek as explained above, and the continuance of regular passenger services to and from this port will be very difficult in the near future, unless arrangements are made to dredge the silted portion of the creek in time. This matter should therefore receive the urgent attention of the authorities concerned. It may be added that, even with increased bus services direct between Bombay and centres in Kolaba District, there will always remain a fairly big proportion of passenger traffic which would prefer the shorter and less tedious "hop" across to Dharamtar to the long winded overland route *via* Panwel and Pen to destinations in Kolaba District.

*Konkan Coast.*—Siltation has been in progress almost at all the ports on the Konkan Coast. It has been rapid in some places and slow in others. The ports of Dabhol, Jaigad, Jaitapur and Vijaydurg on the Konkan Coast are situated at the mouths of creeks. Formation of sand-bars takes place at the mouth of each creek and shoals varying in number and size have come into existence in all the above Creeks.

Detailed information regarding the rapidity with which siltation is taking place at all the ports on Konkan Coast, is not available. In order to maintain the efficient utility of these ports, it is necessary to maintain a record as to yearly siltation and to take steps to remove the silt at frequent intervals. As at present, this is not attended to at all.

*Dabhol and Malwan* are the two important ports on the Konkan Coast situated in a densely populated area of the Ratnagiri District. Formation of silt in the harbour at Malwan, and on the bar at Dabhol, during the recent years, is causing considerable obstruction to navigation at these ports at present. Unless proper precautions are taken in time to remove the above obstructions, it will be increasingly difficult to navigate to and from these ports which will lose their importance in the near future, causing innumerable difficulties to a vast population residing in this area of the District.

*Karwar.*—The passenger traffic at this port has doubled since the introduction of our latest cargo-cum-passenger steamer, s. s. SABARMATI and is not expected to fall below its present level in future. The port, however, provides no amenities for passengers. There is no waiting shed nor drinking water arrangements for them. This Company has, however, a small shed of its own for the passengers, but this is not sufficient.

*Bhatkal* is yet another port in the South which patronises the sea route, but where too the port provides no amenities of any sort for the passengers for whom the Company has to put up year in and year out, a cudgeon shed at the present embarkation/landing site. The old boat jetty is no longer of any use owing to the silting of the channel, and embarkation and disembarkation has, therefore, to be done on the sandy beach in the same manner as is being done at Ratnagiri during the ebb tides.

*Malpe* in the Madras Presidency has no boat jetty for its weekly 200/250 incoming and a like number of outgoing passengers, a majority of whom come from adjacent towns and villages. The operation of landing and embarking passengers has therefore to be conducted on the sandy beach opposite the newly-built Port Godown.

The position at the district place of Mangalore which sends 200/300 and lands a like number of passengers every week by our steamer, is still more lamentable. The only Passenger Waiting Shed which truly resembles a cattle shed is used by the Customs authorities for examination of baggage as the steamer serves Mormugao *en route* and incoming and outgoing passengers are baked in the sun with a single filthy latrine in the area for their use and no facilities whatsoever for drinking water. The boat jetty which was pulled down during the war times as a security measure has not been put up again and the passengers have therefore to undergo additional hardships on dead low tides. It appears that even minor improvements have been held in abeyance pending the final selection of a port in the South for major development.

*Cutch Mandvi*.—This is the only port in the North from where we get good passenger traffic both ways. The Customs have to examine the passengers' baggage in open wharf before they board passenger boats to go to the steamer. The most of the passenger traffic is from the hinterlands and the passengers have to come on the previous night to Cutch Mandvi and they stay in Dharmshalas at Mandvi. There is no shed for passengers either for waiting or for baggage examination.

Landing and Wharfage Fees Fund Committee at Bombay has been entrusted with the work of providing landing facilities and amenities to passengers embarking and disembarking at various ports up to Bhatkal.

Enclosed herewith is a copy of letter dated 22nd March 1951 addressed by us to the Chairman of the Landing and Wharfage Fees Fund Committee and the same will give an idea of the suggestions made by us in connection with the improvements in landing facilities etc., at various ports served by our steamers. In this connection we have particularly to draw your attention to the following three items.

*Anchorage Buoys*. Consider—able difficulty is being experienced by the passengers at the time of embarkation and disembarkation at each port in the absence of suitable buoys where our steamers could safely anchor. At present we are maintaining buoys at Palshet, Boria and Tivari. We have requested the Collector of Central Excise to take over the above buoys. No decision has yet been taken in the above matter.

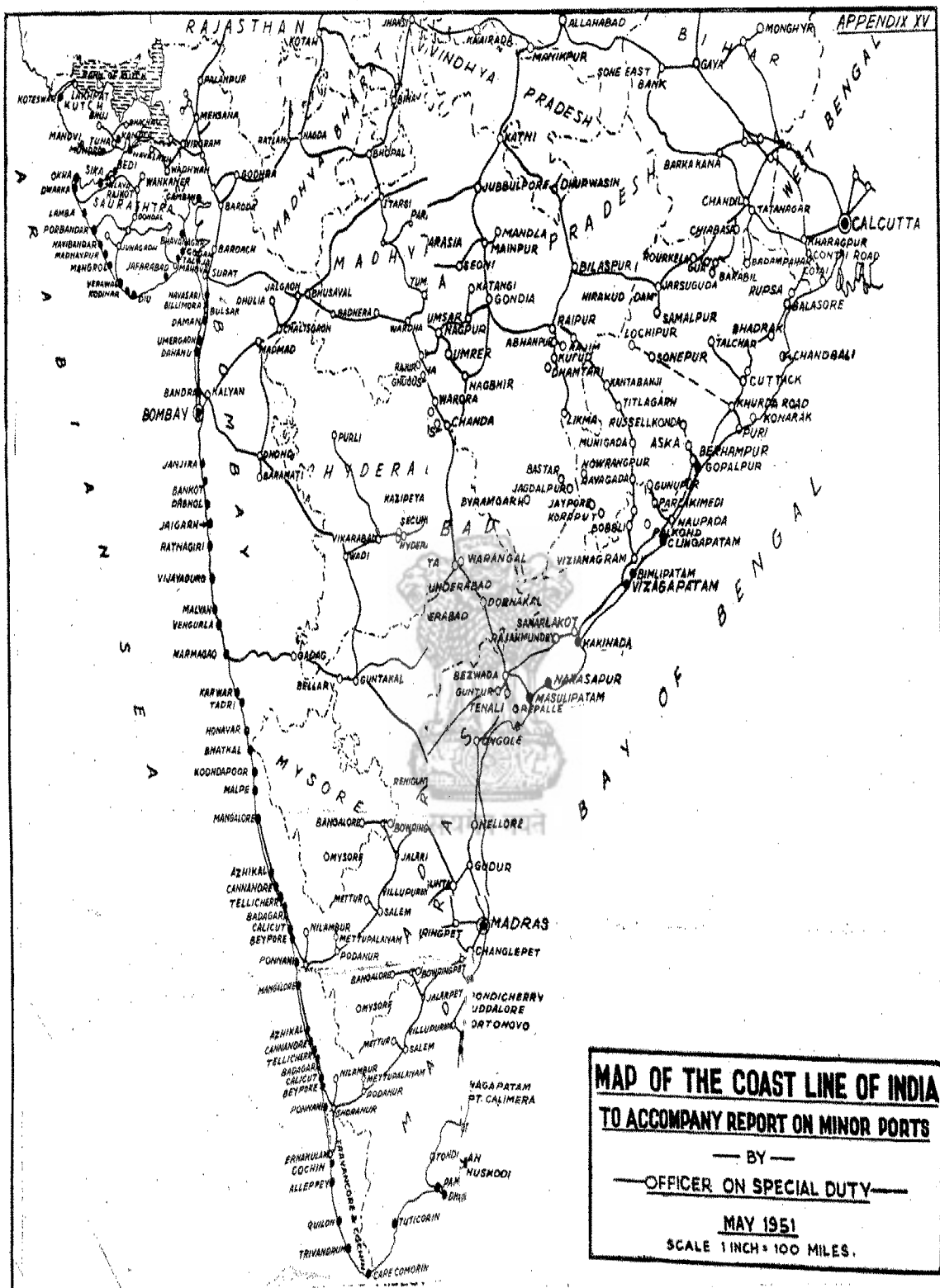
*Lights*.—Adequate navigation lights have not been provided at all the ports on the Coast. At certain ports these lights are being maintained by the Company and a list of the same is enclosed herewith. These lights also should be maintained by the Landing and Wharfage Fees Fund Committee. It is necessary to carry out the above suggestions at an early date.

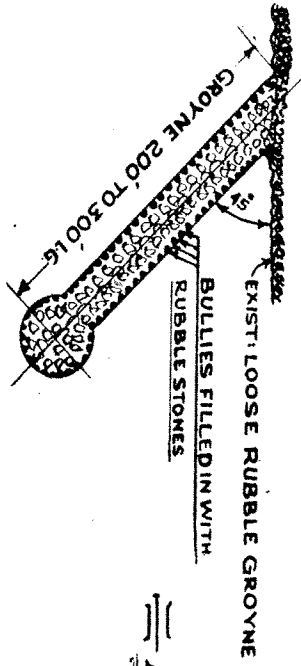
*Signalling arrangements.*—It is also necessary to have some sort of signalling arrangements at each port to indicate the arrival and departure timings of our steamers

We have made certain detailed observations in regard to the points raised in your letter. As already mentioned, passengers generally prefer sea travel to any other form of land travel because actually they get not only more space per passenger for themselves and for their baggage but the journey is free from dust and more comfortable.

We suggest that looking to the passenger traffic on the Konkan side, the ports of Harnai, Dabhol, Jaigad, Ratnagiri, Jaitapur, Vijaydurg, Deogad, Malvan and Vengurla need to be specially looked after in the matter of all possible improvements in regard to passenger facilities like waiting arrangements, drinking water facilities, sanitary arrangements, lighting arrangements in and around the waiting sheds etc. Even further South at the Ports of Karwar, Bhatkal, Malpe and Mangalore the conditions are much worse and the facilities available there in regard to the above matters need improvements at an early date. Similarly at Cutch Mandvi which is the last passenger traffic port, better arrangements are necessary to be made in the matter of passenger boats for embarkation and disembarkation purposes, which it may be added are licensed by and under the control of the Government Authorities there, as also in the matter of waiting sheds, drinking water facilities, sanitary arrangements and lighting arrangements.

While we note that no large scale development of minor Ports is contemplated, we on our part would request you to appreciate the fact that the ports mentioned have a very large passenger traffic record and it is necessary that certain essential facilities on the lines suggested above should be provided at an early date. You may be aware that at Konkan Line ports and also at the Mangalore Line ports the necessary wharfage fees are collected from the passengers for providing the facilities referred to above, but still the conditions are not very satisfactory. At Konkan ports the passengers would very much appreciate and they so often pressed for small jetties or embarkation and disembarkation points at which the passenger boats/lighters could come alongside to land passengers without any necessity on the part of the passengers to walk in knee deep waters sometimes often during the night periods.





**DETAIL OF GROYNE**

**PLAN OF MANDVI HARBOUR**

